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ABSTRACT

Based on searches by the National Commission on Excellence in Education for notable programs, practices, and goals in American postsecondary education, efforts at 120 postsecondary institutions are described. The descriptions are grouped, with each group preceded by a short introductory essay. The following topics are covered by the essays: the transition from secondary to postsecondary education and school/college cooperation; the freshman year; retention and academic work; competing models of general/liberal education; the reconciliation of liberal arts and career education; scientific and technological literacy for the nonscience major; language--expanding personal space; postsecondary honors programs; academic time--calendars of institutions and individuals; joint ventures of colleges and employers/worker education; and assessment. Under the topic of transition from secondary to postsecondary education, the following subtopics are covered: the reallocation of academic time and content, the raising of expectations through outreach and recruitment, and the exchange and development of academic personnel. Appended are: (1) a list of types of programs/approaches of interest to the National Commission; and (2) guidelines for schools in preparing the program profile. (SW)

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Starting with Students:
Promising Approaches in American Higher Education

Prepared from materials submitted to the National Commission on Excellence in Education

by
Clifford Adelman
Senior Associate
National Institute of Education

with the assistance of
Elaine Reuben

Presented to
The Study Group on the Conditions of Excellence in American Higher Education

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But this volume would not exist without the extraordinary care with which hundreds of college faculty and administrators prepared and submitted profiles and essays on their programs. They may not admit it, but there was much love in their efforts, and a dedication that can only bode well for the learning and growth of students.

* * * *

The observations and conclusions offered in this volume are those of the principal author. They should not be taken as representing the opinions or positions of the National Institute of Education, the U.S. Department of Education, the National Commission on Excellence in Education or any of the former Commissioners, or the Study Group on the Conditions of Excellence in American Higher Education or any of its members.

STARTING WITH STUDENTS:
Promising Approaches in American Higher Education

Introduction: Purposes, Focus, and Methods

The impetus for this project lay in the Charter of the National Commission on Excellence in Education, and specifically in the charge to the Commission by former Secretary of Education, T.H. Bell, "to review and to describe educational programs that are recognized as preparing students who . . . meet with uncommon success the demands placed on them by the nation's colleges and universities."

With the assistance of a variety of organizations, the staff of the Commission thus conducted three searches for examples of notable programs and promising approaches to twenty-eight (28) specific problems, practices and goals in American postsecondary education.

The process of these searches is described below, but it should be noted here that each solicited "profiles" of programs, prepared by their directors in such a way as to cover 11 key questions concerning program purpose, content, organization, impact, and transferrability (see Appendix A). It is thus important to point out that neither the Commission nor its staff was in any position to validate these programs. Our purpose was not to place the "Good Housekeeping Seal of Approval," so to speak, on the materials prepared and submitted by others, and, as our disclaimer notes, neither the selections nor the opinions in this volume (or its original version) are those of the U. S. Department of Education. We are simply sharing a staff paper with a larger audience.

The reviews in this volume are tertiary sources. The primary sources are the programs themselves. We examined prepared profiles--which are representations of the programs. When we make judgments, then, it is of the claims or assertions or descriptions contained in these representations. Where the evidence is curious, where it is contradictory, where it is convincing, and where it is missing, we say so. But in no case are we judging anything more than the representation of the reality. What you read, then, is loosely analogous to literary criticism.

Why Postsecondary Programs?

While the Commission focused its final report principally on secondary education, its background work was much broader in scope and paid considerable attention to postsecondary matters. That background work, in fact, was organized by topic and not by level of schooling. Indeed, when the Commissioners began to write A Nation at Risk, they first sifted all the testimony and evidence they had gathered through such rubrics as Credentials and Credentialism; Testing, Examination and Assessment; Governance and Leadership; Curriculum: Common and Diverse; the Education of Special Populations; and Civic Education. Earlier in their work, the Commissioners determined that a number of these topics could be considerably illuminated by consideration of their postsecondary dimensions. Besides, as the Commission well recognized:

1) The hopes and expectations of individual students and parents are usually focused on the upper end of the continuum of American education;

2) Our society and economy have made a postsecondary degree the basic qualifying credential for a growing list of occupations; and that the distinction between compulsory and necessary schooling may only be that between de jure and de facto;

3) Thus, over 70% of our high school graduates today will eventually attend a postsecondary institution for one or more years;

4) Evolutions and revolutions in the content of the disciplines originate in colleges and universities, are first tried out in postsecondary contexts, and then filter down into the system through textbooks, professional associations and learned societies--all of which are dominated by college faculty;

5) College faculty set the standards of content for examinations (SATs, ACTs, College Board Achievement Tests) which, in turn, function as de facto statements of expectations for teaching and learning in secondary schools;

6) Not only college admissions requirements, but also college exit standards, exert great influence on secondary school curricula and patterns of high school student course-taking;

7) Colleges and universities train not only the teachers but also the administrators of schools; and both teachers and administrators bring the learning and values of higher education to bear on the operation of schools;

8) Colleges and universities educate the vast majority of school board members, legislators and other community leaders who are charged with making decisions concerning what obtains in schools.

Thus, to understand current practices in higher education is to begin to come to grips with a critical chain of influence in American education. It is no wonder that Secretary Bell's first charge to the Commission wisely was "to review and synthesize the data and scholarly literature on the quality of learning and teaching in the nation's schools, colleges, and universities . . . ." [italics mine]. In fact, this project was designed to help the Commission fulfill its obligations under that charge.

Why Focus on Programs?

The Commission was interested in identifying those variables affecting educational performance that could be altered efficiently, and altered in ways that are practically--and not just theoretically--possible. In approaching this task, there were four factors to consider: (1) the diversity of students (abilities, backgrounds, and interests); (2) the diversity of institutional types and environments (for which the range

is much greater in postsecondary education than it at the school level); (3) the variety of measurements of success; and (4) programs and strategies, i.e. specific pedagogical approaches, courses of study, manipulations of requirements, variations in organization etc. that are directed at different types of students in different kinds of institutions. The Commissioners generally agreed that only two of these factors are truly alterable: measurements and programs. But since programs and their objectives (should) determine measurements, the primary focus reinforced the thrust of Secretary Bell's charge.

For example, assume that a "selective" college uses a particular program to enhance the performance of gifted students more than would otherwise be expected. While one might explain with reference to the institutional environment itself, what really does the job of motivating, engaging and teaching the students is the program and its faculty. Likewise, an open-enrollment college may employ a general institutional strategy to advance students of average ability more than would otherwise be expected. Neither the entering abilities of the students nor the institutional admissions policy (which may be set by state law) are alterable. But the strategy can be manipulated.

How Did we Search? What Problems and Topics were Addressed?

Our first task was to design a procedure for generating information on programs that would go beyond "dog-and-pony-shows" to the deeper understandings required by the Commission. After consultation with a number of experts in dissemination and program evaluation, and with reference to both the existing literature and educational practice, we developed a guideline for the preparation of program "profiles." The eleven issues covered on that guideline allowed program directors to define:

- o The problem addressed by the program and the ways in which that problem was identified;
- o The objectives of the program and their underlying theories;
- o The specific population(s) for whom the program was developed;
- o Essential characteristics of the program (who? what? where? when? how? etc.) and the assumptions underlying them;
- o Program results: not merely concrete evidence of student achievement, but some empirical indication of how that achievement exceeds the normal expectations for the target student population;
- o Secondary benefits of the program (for the institution, its faculty, its service district, etc.);
- o Transportable features of the program, and an estimate of barriers to success that might exist in other settings.

Using this guideline, the first search for notable and promising programs was a modest trial heat. We chose the Commission's public hearing on Science and Mathematics education (at Stanford University, March 11, 1982) as the occasion. Our objective was to provide the Commissioners with sufficient background material so that they could come to the hearing with a feel for what different kinds of colleges

were doing to improve science education for students of varying levels of ability. It was understood that if the Commissioners found that this process yielded helpful information, we would repeat it on a larger scale and with reference to other issues.

Due to limitations of time and our own desire to deal with a finite number of programs, we asked some national organizations and agencies to identify programs they felt might be worth examining. Approximately 35 programs were so identified and invited to submit profiles. Over half did so, a very gratifying rate of response. An analytical summary of what we received, along with abstracts from a sample of the profiles, was prepared.

Having analyzed the results of the trial search, we adjusted our guidelines, and used a slightly different procedure for the second search. Again, the impetus was a public hearing of the Commission, this time on "College Admissions and the Transition to Postsecondary Education" (held in Chicago, on June 23, 1982). In preparation for that Hearing we engaged in a special focus search for programs addressing problems associated with the transition to higher education, particularly those programs involving cooperative relationships between high schools and colleges.

The method of search, though, was different. First, drawing on the files of the National Association of Secondary School Principles, the Academy for Educational Development, the Fund for the Improvement of Postsecondary Education and others, the staff identified approximately 50 programs that were then invited to submit profiles. Second, an announcement of the search was printed--in full or in part--in the regular publications of such organizations as the American Association for Higher Education, the American Association of Community and Junior Colleges, the American Association of State Colleges and Universities, and the American Association of Colleges. The announcement invited program directors to contact the staff. During telephone conversations with each person who did so, it was determined whether it would be both profitable for the Commission and worth the program director's time to develop a full profile. Subsequently, analytical abstracts of 40 program profiles were presented to the Commissioners in a document that also described the process.

After the Chicago hearing, after the Commission had received a dozen commissioned papers on a variety of postsecondary issues, and after special Commission seminars on "Performance Expectations in American Education" and "College Curriculum: Shape, Influence and Assessment," the American Council on Education was contracted to undertake our third--and most comprehensive--search for notable and promising programs. In September of 1982, the ACE put together a letter and package (see Appendix B) that was sent to 3300 presidents of colleges, community colleges, universities, and technical institutes. The package provided a list of 22 topics in which we were interested, the guidelines for profiles and a sample profile received in one of the earlier searches. The college presidents evidently assigned the task of responding to other academic administrators or faculty. Each institution

thus decided whether and what to submit; and the nature and number of submissions probably reflected organizational processes more than the totality of improvement efforts in any one institution.

By such means, the ACE collected and categorized nearly 250 program profiles and other communications from approximately 150 institutions of all kinds in 35 states. While vast, this collection is hardly inclusive. Acting on behalf of the Commission, we never set out with the idea that we would hear about every program in the country that somebody thought was noteworthy or promising.

Of the roughly 300 programs submitting profiles, other materials and miscellaneous communications, 235 were written up (as described below) in the first version of this document. Starting with Students was originally prepared in two volumes, and was available through the ERIC system in microfiche and hard copy (Vol. I, ED#237-051; Vol. II, ED# 255-169). This volume, containing reviews of 120 programs, differs from the first version in significant ways.

What Did We Receive?

As one might expect, there was an extraordinary range in the quality of the documents and in the apparent quality of the programs presented to the Commission in all three of its searches. Some of these programs appeared to be landmarks in the improvement of American education and spoke eloquently to the emerging themes and particulars of the national discussion stimulated by A Nation at Risk--and subsequently, by Involvement in Learning, To Reclaim a Legacy, and Integrity in the College Curriculum. Other profiles and documents were no less instructive in their unintentional revelation of the occasional paucity of imagination in American higher education and the difficulty it has in describing both the objectives and effects of its work.

After all, given the wording of Secretary Bell's charge to the Commission, we were most interested in indicators of program success; and our unwritten guideline in judging those measures was only that they be appropriate to the objectives of a program or strategy. While we were not rigid, this is an area in which higher education is very weak. Education program design is hardly a science, but the relationship between what one intends and what one does has to be concrete and clear. If you say you are teaching "critical thinking," it is reasonable for an outsider (let alone a student) to ask how "critical thinking" is defined and how it is manifest in discrete teaching and learning activities in a course or program. Unfortunately, there were too many instances in the profiles we received in which objectives were vague, operations were generalized, and/or the relationship between objectives and operations was unclear. Likewise, one has to demonstrate success, not claim it; one has to present adequate and suitable evidence, not intuitions or "vibrations." And while there may be multiple indicators of program success (not all of them quantitative or textbook models of pre/post assessment), some are more convincing than others. The reader will note that I place considerable emphasis on these issues in the reviews.

Indeed, the "analytical abstracts," as we called them, sometimes evidence the character of reviews more than that of mere summaries. Some called out for explication and judgment; and if we intended to help the Commissioners discern what was appropriate to context and constituency, what was hackneyed, and what was creative, those judgment calls had to be made. I take full responsibility for them.

But no matter what degree of quality we confronted in these documents, as a body, they provide some extraordinary roadsigns for reform.

What Programs are Reviewed Here? And How?

Even in the original version of Starting with Students, I did not choose to review all the programs on which we received information. The first decision was to separate out those submissions that were either unworkable (e.g. two volumes of curricular materials with a one paragraph covering letter) or insufficient (e.g. a two paragraph letter or a printed brochure). None of these were reviewed; nor were programs in the planning stages or general statements of institutional mission.

Approximately 10% of the profiles submitted through the ACE search described programs in graduate and professional schools. While graduate education was not an explicit interest of the Commission, some of these programs illustrate promising and transferrable approaches to more generic problems, and hence were reviewed. Others were not, and on the grounds that to do so would be to paint too limited a picture of the vast enterprise of graduate and professional education in America.

The materials that remained first had to be read and organized in categories for which a brief but coherent introduction could be written. Since we were blending profiles from all three searches, we reconstituted ACE's distribution, and, in the process, reduced the number of categories from 28 to 22. This condensation presented some problems in placing individual profiles. For example, a freshman year community college program employing instructional technology in the teaching of writing could have been placed in any one of four categories. We tried to be consistent by analyzing a program under the rubric it illuminated best or (where there was no clear choice) by placing it under a category indicated by the covering letter.

The introductory essays are intended to highlight the tenor of the materials received, the strengths and weaknesses of the evidence, and/or the general character of the problems addressed. These essays are hardly intended to be comprehensive, or to review the extant literature. As in the case of the abstracts, though, the principal author was inevitably stimulated by some issues more than others. No report such as this can be value-free.

For this version of Starting with Students, I first selected only the most substantive of the reviews from the original, then wrote (in May of 1984) to over 150 program directors, asking whether they had any information to add or clarifications to make in light of our original review. Approximately 65 did so, and I have taken account of their

communications in this volume. The second task was to eliminate the redundancies. That is, if there were three examples of the same generic response to a problem or three examples of a specific program form, I tried to select two of the three--representing different types of institutions--from which the reader could learn the most. In the process, I also deleted those reviews which, in a volume such as this, would be embarrassing to the institutions from which they came. Third, I decided to cut two of the original 13 topics, "Teacher Education: Selection and Training in the Disciplines" and "The Uses of Instructional Technology," because the samples of programs in these categories were the smallest and least representative of all the topics covered.

The Limitations of this Document

Like many such efforts, this is an imperfect document.

The fundamental frustration lies in working from representations of programs, rather than direct observation. The constraints of time, too, prevented us from holding long telephone discussions with 300 program directors asking them to clarify various statements in the profiles. The form of judgment, then, is aesthetic, but in the Kantian sense of the term: an agreement between the mind and its subject.

Furthermore, we unfortunately did not cover some topics that were pertinent to the Commission's lines of inquiry, let alone the subsequent inquiry of the NIE Study Group on the Conditions of Excellence in American Higher Education (which wrote Involvement in Learning). Academic advisement is one that stands out in this regard, though it turns up indirectly in many programs. We also failed to highlight certain approaches to instructional design such as mastery learning or contract learning--though, again, these turn up in some profiles.

Thirdly, there are issues covered in the profiles that I have inconsistently reported and assessed in the reviews. Questions concerning barriers to success, organizational influences and transferrability were included in the guidelines, but only about a third of the profiles provided sufficient information on those issues. As for resources, it is worth noting that more than half of the programs reviewed here were assisted at one or more stage of their development by the Fund for the Improvement of Postsecondary Education, the National Science Foundation, the National Endowment for the Humanities, or various private foundations. Information in the profiles concerning resource development and allocation, however, was scant.

Fourth, despite condensing our categories to 11 in this volume, the evidence in some areas is insufficient to draw conclusions about the major trends or quality of current improvement efforts in American higher education. No matter how broad the coverage of this undertaking, then, we urge the reader not to use this volume as an exclusive touchstone. For we know, too, of many innovative programs and efforts addressing these topics from which we did not hear. Response to any of the soliciations, after all, was wholly voluntary.

On this last--and very important--point, John Wisdom's metaphor for the relationship between language and knowledge may be a fitting conclusion. Our language, he said, is like a net. We cast that net in a sea (a universe) filled with an infinite variety of fish (objects of knowledge), some of which we can know. But what we wind up knowing is dependent on the net of our language and the way we cast it, not what is in the sea.

A Final Word: "Involvement in Learning"

Within a few months of the issuance of A Nation at Risk, the National Institute of Education had established a "Study Group on the Conditions of Excellence in American Higher Education." This group was charged with making suggestions concerning the ways in which the findings of research and the lessons of practice could be utilized by college faculty and administrators in their efforts to improve curriculum and instruction. Selected on the basis of their diverse knowledge and experience, the members of the Study Group functioned as a seminar and spent a year analyzing all the background materials on higher education--including the 235 reviews in the first version of Starting with Students--prepared for the National Commission, as well as other recent reports and studies, and a quarter-century of syntheses of research and practice. The product of their analysis, Involvement in Learning: Realizing the Potential of American Higher Education, was released in October of 1984. Based on the initial responses to that report in the media and in the higher education community, it is fair to say that the materials presented here will likely be used by many faculty and administrators in addressing the challenging recommendations offered by the NIE Study Group.

Early in the Study Group's work, one member observed that a report such as what became Involvement in Learning can perform a national leadership role if it catches a tide that is already rising, if it serves to coalesce the existing interests and energies of its natural constituents. The nearly 200 institutions whose work has been reported and reviewed in Starting with Students have provided adequate evidence that the tide is rising, that there is concern and energy, and that American higher education has a remarkable capacity for renewal.

* * * *

Textual Notes:

(1) Unless indicated an introductory essay to a section, no interpretation should be made or the order in which reviews are presented.

(2) There was a division of labor in writing the abstracts. Elaine Reuben, a Washington-based educational consultant, assisted in the drafting of a number of these reviews. Where her drafts became largely the final form of the review, the fact is so indicated by her initials, (ER).

PART A:

THE TRANSITION FROM SECONDARY TO POSTSECONDARY EDUCATION: SCHOOL/COLLEGE COOPERATION

The boundaries between secondary and postsecondary education may not be as rigid for students as they are for institutions. While they were charged to deal with it as a discrete issue, it became apparent to the National Commission that college admissions, for example, is but one step in a far more complex process of transition that begins with high school counseling and ends with college persistence (if, indeed, the process ever ends). To help understand that process--as well as the ways in which the boundaries between secondary and postsecondary education have become more fluid--the profiles reviewed in this section were gathered.

There are a number of frameworks within which the considerable amount of material received under this rubric could be organized and presented. Our first decision was to separate out post-matriculation programs operated wholly by colleges and community colleges (that is, with no secondary school participation), and directed at the very significant problems associated with student adaptation to the college environment and curriculum. Abstracts of those profiles appear in the sections, "The Freshman Year: The Rite of Passage," and "Retention and Academic Work."

For the material that remained, we used two principles to determine this presentation. The first was indirectly suggested by the concepts of Time, Content, Expectations, Teaching, and Leadership that organized the Commission's analysis of American education; and we saw those five concepts reflected in these profiles. The second was the cui bono (who benefits?) principle. In a matrix, the two generated the following analytical framework:

- The Reallocation of Academic Time and Content: time-shortened degrees, early colleges, college credits in high school, and similar programs directed at high school students who have pretty much made up their minds to go to college and who generally have demonstrated the ability to do so.

- The Raising of Expectations: Outreach and Recruitment: a variety of pre-matriculation strategies designed to motivate and prepare disadvantaged, under-prepared and/or poorly counselled students for postsecondary education, to track them into demanding academic programs, and to recruit them into college, and/or specific academic fields.

- The Exchange and Development of Academic Personnel: programs that seek both to eliminate redundancies in the secondary and postsecondary curriculum and to enrich the content of the secondary school curriculum by using college faculty in secondary schools or through cooperative (secondary/postsecondary) faculty development projects in specific academic disciplines. In these programs, students are the secondary beneficiaries.

To be sure, some of the programs reviewed below can fall into more than one of these categories; and there is no question that the categories themselves are rather broad. Thus our procedure will be to take them seriatim, to expand on what is at issue in each, and then to provide abstracts of those programs that seem to illustrate the most critical variables.

THE REALLOCATION OF ACADEMIC TIME AND CONTENT

A major concern of the school/college programs we examined was the use of time allocated for learning between the 9th grade and the attainment of a postsecondary credential--Associate's or Bachelor's degree. By custom (and sometimes, by law), students expect to spend 4 years in secondary school, take an additional 2 years to the Associate's degree or an additional 4 years to the Bachelor's degree. Progress to these milestones is usually measured by credits, the proxy units for time.

But many of these programs evidence a counter-tradition based on the assumption that students should be able to move through the continuum of education at their own pace and by virtue of demonstrable achievement, not by the dictates of an actuarial time-table. This counter-tradition was born of consideration for the needs of more gifted students, and has been manifest for a quarter-century in the Advanced Placement program, the International Baccalaureate, and similar programs which shorten the time to postsecondary credentials without measurably increasing the amount of learning, or content. As postsecondary education has become so much more expensive in recent years, there is a significant motivation for students to enter into one or more of the structures we have created for time-shortened degrees-- all of which provide the opportunity to earn college credit or credit-equivalence while in high school.

A complementary strategy also turned up in our materials, namely, that which aims to increase the amount of student learning within the customary allocation of time. Credits are nice--but not necessary--this strategy implies; and besides, we know that a majority of our college students now take more than 4 years to complete the B.A. (and more than 2 to complete the A.A.). So why rush it? Learn more or learn it better!

Both strategies are designed to enrich one or more aspects of the education of college-bound students, i.e. there is little doubt but that the vast majority of secondary school students who elect these programs will matriculate in a college or community college. Thus considerable energy is devoted to a preview of the nature of postsecondary academic work, and, in many cases, the atmosphere of a college.

1. Matteo Ricci College (Wash.)

Matteo Ricci is a noted experiment in the Time Condensed Baccalaureate that moves students from grade 9 to a grade 14 B.A. It is conducted as a college-within (or enclave) at Seattle Preparatory School (for grades 9-11) and Seattle University (for grades 12-14), and has operated since

the fall of 1975. Students completing grade 12 at the University can request--and receive--a high school diploma from Seattle Prep.

The program addresses "the costly and stifling repetition" in the academic content of high school and lower division college courses, the lack of integration in the educational process at the secondary and postsecondary levels, the fragmentation of students' lives and the loss of moral values in education.

The program is dominated by 3-year integrated courses in composition, aesthetic development, unified science, foreign language, mathematics, cultural studies, religious development, humanistic inquiry, and psycho-physical development. The portion of the curriculum for grades 9-12 is taught by a permanent faculty of 40. The portion for "grades" 12-14 is taught by approximately 35 faculty borrowed (some full-time but most part-time) from 13 departments at the University. For this program to succeed, the faculty at both campuses function as a learning community that constantly evaluates, redesigns, expands, improves, and at all times tries to insure continuity and sequence in learning objectives and tasks. In a sense, Matteo Ricci has become the faculty development program for Seattle University.

Program impact is measured by the ACT COMP (Comprehensive Outcomes Measurement Project) examination (administered both at the beginning of grade 12 and at graduation) and by comparing ACT scores with those of control groups (local and national). Results show Matteo Ricci students performing at comparable or higher levels.

Over 150 students have graduated to date, with roughly two-thirds continuing on for further study. Approximately 725 students of very diverse backgrounds are currently enrolled, of whom approximately 40% receive financial assistance toward tuition. This assistance is very necessary for families that face the significant jump in tuition that occurs between grade 11 and grade 12.

2. Simon's Rock of Bard College (Mass.)

Simon's Rock was established in 1974 on the model of the Hutchins college at the University of Chicago in the 1930s--namely, as a two or four year collegiate "bridge" commencing in the 10th or 11th grade and concluding with either the A.A. and transfer in Grade 12 or with the B.A. in Grade 14.

But it would be a mistake to think of the "Early College" of Simon's Rock as simply a time-shortened degree strategy. Rather, it is a thoughtful institutional recognition that stages of cognitive, social and moral development are not strictly correlated with age. The program is not intended for the extraordinarily gifted student, rather for the type of student who is difficult to describe in traditional terms: of above average academic aptitude and high school achievement, but also possessing a degree of maturity and intuitive preparation for the radically different teaching and learning styles expected in higher education.

The academic program involves a comparatively structured lower division General Education curriculum leading to the A.A., consisting of English, mathematics, science, art, foreign language and three semesters of General Education seminars in historical, cultural and moral perspectives. This curriculum appears to be a particularly strong and promising model for community college transfer programs. The lower division core is followed by one of seven interdisciplinary majors in the upper division years, leading to the B.A.

Personal development is equally emphasized in an informal curriculum grounded in the theories of Perry, Kohlberg, Loevinger, Piaget and others, and through great sensitivity to the tumult of late adolescence. Students must learn "to make choices with the understanding that choices have consequences," the profile writers note; but in order to learn, the environment must "minimize the risk of serious consequences resulting from poor judgment." This theory applies far more to the informal curriculum than to the formal; and, as a consequence, faculty and staff must play multiple roles.

Longitudinal and comparative studies of graduates demonstrate significant value-added in developmental (cognitive, moral, aesthetic) terms. The academic records of transfer students are strong, and 30% of the B.A. graduates enter directly into graduate school.

3. Clarkson College of Technology (New York)

In the late 19th and early 20th centuries, a number of American colleges operated residential preparatory schools on their campuses. The Clarkson School and its "Bridging Year Program" is reminiscent of that phenomenon. The program is expressly designed for talented high school seniors with demonstrated interests and ability in science, engineering and related fields. The program brings 20-30 students to the Clarkson campus for a residential year during which they take a full schedule of freshman courses with college students. They live in four group houses adjacent to the campus but separate from other student housing.

The program thus provides a necessary balance between interaction with and separation from traditional college students. Like Simon's Rock, Clarkson believes that talented and socially mature students profit from an early start on college, but that these students also need a supportive living environment and careful monitoring of progress.

Part of the educational process for budding engineers and scientists should include attention to co-curricular areas of personal development, and the Clarkson program requires students to set goals and earn "self-development units" in human relations and communications skills, physical conditioning, awareness of the arts and awareness of the place of professionals in society.

In May of 1982, a full assessment was made of student progress since the initiation of the program in 1978. Only two students (1.7%) had ever left the program (in comparison to a 10-15% attrition rate for Clarkson freshmen). Of all students who had been involved in the program, 96.6% either were enrolled in college or had graduated (30% from institutions

other than Clarkson itself). Academic performance of Bridging Year alumni also exceeded what would be expected for Clarkson College students, and those program alumni at other colleges were achieving above the mean for their classes as well. (ER)

4. Syracuse University, et. al.

Generally regarded as the most successful and highly replicated model of college course-taking by high school seniors, Project Advance serves 75 high schools and 4100 students in four states. In existence since 1973, the program was designed to address both the curricular redundancy between upper level high school courses and lower level college courses and the lack of challenge in the senior high school year for college bound students. Syracuse considered a variety of options to address this problem (early graduation, Advanced Placement, college courses taught in high schools by college faculty, and "split-day" programs) before arriving at the strategy of training and deputizing high school teachers to offer credit-bearing college courses as part of the regular academic program of the high schools.

The profile presented to the Commission is an extraordinarily rich portrait, particularly with respect to data on the impact of this program on students, e.g.:

- o 98% of the graduates attended college;
- o Of the college attendees, 99% completed or expected to complete degrees (2½ times the national average);
- o Only 12% took time-shortened degrees (a significant figure, since folk wisdom assumes a much higher percentage);
- o 88% achieved a GPA of 3.0 or better;
- o 56% were either attending or planned to attend graduate or professional school.

The key to the Project Advance model lies in the careful selection and summer training of high school teachers for appointment as college adjunct faculty. Curricular outlines and materials (including manuals, tests and assessments, and record-keeping instruments) are prepared and courses offered in English, biology, calculus, chemistry, psychology, and sociology. The courses are carefully monitored by University faculty and Project staff (who visit each class, and check student papers and examinations) to ensure that standards are identical to those in the same courses as offered at Syracuse. The cost to the student is $28 per credit (with a limited amount of scholarship aid available to the financially needy), with the participating high schools bearing costs for training workshops, released time for in-service seminars, and materials.

What struck us as most remarkable about Project Advance was the impact of the program on both secondary and postsecondary curriculum. While the evidence is a bit soft, some participating high schools have "geared up" their 9-11th grade curricula so that all college bound students could be ready for the demands of Project courses. At the same time--and even though this program is not a recruiting device for Syracuse--some departments at the University have made adjustments in

course content and structure as a result of changes at the secondary level. Given such benefits of a cooperative relationship within a geographic region, the model is eminently transportable, though it takes a lot of sweat to realize.

5. University of Iowa

The University of Iowa offers a number of outreach programs; and two, in particular, employ thoughtful approaches to curriculum development and program organization for distinct groups of gifted secondary school students.

The Secondary Student Training Program is an "early admissions" summer project that has focused on gifted high school students with interests in science and mathematics since 1960. Some 400 students attend annually. The program employs an "Enrichment Triad Model" emphasizing general exploration, group training in skills and processes, and individual investigations in traditional classroom courses (e.g. Molecular and Cellular Biology), field-based courses (e.g. a Yellowstone Ecology Program), and research practicums in which students are placed in supervised positions in research laboratories. These enrichment and acceleration experiences are typically unavailable to secondary school students.

But what distinguishes this approach to "summer school" for the gifted is that college credit is awarded to qualifying students as early as the summer between the 10th and 11th grade. Follow up studies of those students who matriculate at the University of Iowa (about half of the program participants) indicate much higher academic performance than the mean for entering freshmen, but there is no way to determine how much--if anything-- the program contributed to that difference.

Perhaps what is more significant, though, is that the curricula for this program are developed by teams of secondary school teachers, undergraduate teacher education majors, and college faculty from the scientific disciplines, a process that provides for extraordinarily close working relationships between the University and local school districts as well as a unique training opportunity for future teachers.

The reallocation and enrichment of academic content at the secondary school level in preparation for higher education can also involve the performing arts. Although we usually do not think of the arts at all in this context, it should be obvious that one of the areas that gifted and talented youth tend to come to our attention is precisely here. Within the past few years, the University has developed a Gifted and Talented Program in Dance to provide quality pre-collegiate training and performing opportunities, particularly for teenagers with 5-7 years of previous training and from school systems which lack both qualified personnel and provisions for programming in dance. Approximately 40 students per year participate (considering, for example, that 1 out of 6

Iowa City School District students are enrolled in private dance studios, the impact may be small but significant).

What is particularly interesting about the dance program is an extraordinary awareness of the cognitive and social skills necessary for dance which are also applicable to college-level academic work and life, and which are thoroughly tested as part of the audition process. These include auditory language skills, visual-spatial relationships, memory and self-concept. A number of hypotheses concerning the relationship between these factors and learning have been built into what promises to be a most enlightened research component of this program.

6. Staten Island Continuum of Education (New York)

The City University of New York, three colleges, and 100 schools on Staten Island have been operating the Bridge Program through a consortium since 1974. It seeks to smooth the transition between levels of schooling and college by creating a number of programs to allow a flow of teachers and students among cooperating institutions.

Approximately 1,000 high school students attend college, taking from three to eight credit hours per semester as a regular part of the school day (though the "school day" is here defined to stretch into the night). Some 2,000 other students take part in non-credit courses, and an additional 1,000 economically or academically disadvantaged students receive special counseling to increase their motivation. The program provides a central advisement service with respect to college choice, admissions processes, financial aid, diagnostic testing, and tutorial assistance. A computer bank offers information on both colleges and special career training options for the non-college bound (a group that is too often overlooked in similar programs).

Data on a random sample of 6,000 student participants (half of whom are classified as average or disadvantaged) indicate that 91% subsequently attend college, and that students value the program for helping them learn to manage study time, develop study habits, and to clarify courses of study and careers.

Parallel to the "bridge" program is an effort involving secondary school and college instructors in the arts, sciences, computer studies, and mathematics that can best be described as a "prelude" to the tough work of curriculum articulation. It uses local conventions and academic fairs to establish the contact and community necessary to a working community, and is also on the way to achieving the status of Project CHIP (see #19 below).

7. Henderson County Junior College (Texas)

In this Concurrent Enrollment program, high school seniors take college courses in English and history during the regular school day, with the awarding of credit deferred until the student graduates. Planned with superintendents, principals and high school counselors, and directed at students in the top 1/3rd of their high school classes, the program has been in existence since 1979. A course will be organized at a local

high school only if 18 students enroll; and the most current data we have show the program running 14 courses in 8 high schools, i.e. serving about 300 students per semester.

Faculty are provided by the community college, not by the high schools. They are selected by the Vice President for Instruction according to their ability "to relate well to younger students." Subsequently, the faculty find that they have to deal with such "novel" problems as absenteeism, student discipline, and dress codes (for themselves as faculty). But one might expect community college faculty to be very enthusiastic about such a program (and they are), in part because they have found a goodly percentage of the high school students to be superior to their own. The community college, too, seems able to identify, prepare and recruit capable students to its programs who might not have attended in the past. Approximately 25% of the students who have participated in the program have subsequently enrolled at Henderson.

This program serves a predominantly rural population for whom such opportunities would not otherwise be available. It is not surprising that the program is administered by the Office of Continuing Education at the College. Given the amount of community cooperation necessary to establish these programs in local high schools, the Office that knows the outside territory best--particularly in a rural environment--may be the wisest choice for management.

8. University of South Florida

Since 1979, the University of South Florida has operated a series of programs for gifted junior and senior high school students. In one of these, the University cooperates with two area school systems to sponsor summer programs for gifted students in mathematics. The school districts select the students and pay for the program (with some private industry support and state funds).

This program seeks to challenge gifted students through an introduction to mathematical concepts and computational and numerical methods of problem solving not available in the school curriculum, and to help them develop applied problem-solving skills using the computer. Curriculum and course content are carefully developed to complement school coursework and stimulate further study. Student achievement during the program is remarkable: post-test scores increase by over 100%.

USF sponsors a similar summer program for the same constituency but emphasizing biological and medical science. The students, selected by the Hillsborough County Program for Gifted Students, participate in a four-week program on the Tampa campus of USF and at the adjacent Veterans Administration Hospital. Lectures, demonstrations and laboratory experiences in electron microscopy, microbiology, vision physiology, cardiology, hemodialysis, radiology and nuclear medicine are given by university and College of Medicine faculty, graduate students and hospital staff.

Student achievement in this second program is measured by pre- and post-tests in biology and microbial genetic engineering. In 1982, the average scores on the former increased from 59.8 to 85.6 and on the latter, from 28.04 to 91.46.

As an outgrowth of these summer programs, the Academic Laboratory Experience was created. Each semester, a small group of students come to USF after school to work on special projects in science and math. Faculty members work on a one-to-one basis in suggesting projects of interest, most of which involve uses of the computer. Many of the students in this program have become early enrollees in the university, and all have entered college. (ER)

THE RAISING OF EXPECTATIONS: OUTREACH AND RECRUITMENT

Programs in this category recognize that access to higher education is neither a dulling slogan nor a passive policy, and that there are students of great potential and poor preparation who need special programs to move them into successful postsecondary careers. Some of these programs also address students whose academic preparation is strong, but whose ignorance of what postsecondary education can do for them is great, and/or whose motivation to continue their education (or to study a particular field, e.g. science and math) is low. Thus the programs range from academic efforts parallel to those discussed in the previous section to guidance and advisement services to testing and diagnostic interventions.

Without an intervention by colleges at the secondary school level, many of these students would be lost to all of us, and some would be lost to those fields in which their talents could flourish best. Cynics would no doubt observe that, with enrollment-driven budgets, some colleges are desperate for bodies to maintain their faculty lines and would recruit virtually anyone holding a high school diploma to do so. But the effort, imagination, and genuine care evidenced in many of these programs belies that assumption. In general, we are <u>not</u> dealing with cases of marketing.

Over half of the profiles in this category describe programs to motivate, recruit and prepare minority students (principally Blacks) for college work and careers in science, engineering and--most of all--the health professions. One can only speculate about why colleges have emphasized the health professions for that particular student population. We know that minorities (exclusive of Asian-Americans) are underrepresented in these fields, and that minority school children have been turned off to the requisite study in math and science at a relatively early point in their school careers. But of all the occupational goals that might motivate targeted minority students to study math and science, those in the health professions are most comprehensible, familiar, and attractive.

Thus, while we might ask whether these particular efforts eventually pay off (something one could not determine for a decade), while we might ask what would be an acceptable return on investment, so to speak, given the

tremendous risks involved, it might be sufficient to look at the outcomes in terms of increased knowledge of math and science on the part of black students, and perhaps increased representation in occupations requiring such a background--whether in the health professions or related fields.

Many of these programs require extraordinary energy and commitment on the part of college staff, who are working an an area (high school coordination) that is not at the center of the organizational structure or culture of a college. Without consistent and sustained support and monitoring by college administrators, these programs would exhaust themselves swimming upstream.

9. Michigan Technological University

The Women in Engineering Program (WIE) was initiated in 1973 to address the problem of low enrollments of women in technically-related fields. WIE was designed to develop awareness of engineering careers in secondary school women with high academic potential. The program is supported by corporate donations and offered to students without cost. Potential students are first recommended by high school counselors, and then go through an admissions process including tests, essays, and interviews.

WIE is a summer program involving intensive one-week workshops for approximately 100 high school juniors and seniors per session. Over 3000 young women and 125 teachers and counselors from high schools in 15 states have attended over the past 12 years.

The workshop introduces the students to the major areas of engineering and technology (e.g. computer programming, electronics, architectural design, photomicrography, etc.), and includes lectures by women engineers. Evidently, the student selects a "curriculum" from a list of "explorations," each of which consumes three hours. A student can work through eleven (11) three hour explorations in the course of a week. Following presentations on a specific area, students have the opportunity to perform laboratory exercises typical of work in that field, a critical feature in motivation and career choice. Such explorations, however short, are intense enough to meet the objectives of the program, particularly as students are also provided with information on cooperative education, admissions standards, financial aid, and opportunities in the military.

A follow-up study of participants in WIE from 1973-1979 indicated that 60% of the college enrollees chose engineering as a career; and in a survey of WIE participants from 1979-84, 75% of the respondents indicated that the Program had helped them choose a career (no doubt some did not choose engineering). At the same time, enrollment of women at Michigan Tech itself has risen from 17% to 23% since the inception of the program. Most of these students major in engineering or science-related fields, and many are subsequently employed as teaching assistants and counselors in the summer program, thus providing a continuity of community. (ER)

10. Clemson University (South Carolina)

The Careers Workshop Program at Clemson is designed to attract bright minority students to the study of engineering. In this respect, it is analogous to the program at Michigan Tech; but the intervention here occurs between the sophomore and junior year of high school, at which time it is still possible to influence academic program choice in the critical years prior to admission.

First offered in 1976, this short-term summer program selects (through review of high school transcripts, recommendations and tests) approximately 60 black students from the Carolinas and Georgia for a progressively more demanding experience. That is, in the first summer, the students will come to Clemson in groups of 30 for two weeks, during which they will be introduced to engineering through very creative and engaging problems and projects (e.g. design and construction of a model bridge or a "survival module for the nuclear age"), beginning computer programming, and a cross-disciplinary course in "interpersonal relationships." In the second summer (between the student's junior and senior year of high school), the program runs for four weeks, and stresses academic mathematics, science (usually Chemistry), English composition, more advanced computer programming (Fortran replacing Basic) and a specific field of engineering.

Career and college admissions counseling intensifies in this second year. In the words of the profile, the counselors are "unashamedly" recruiters for Clemson, but more concerned that the students attend college and strongly consider majoring in engineering. Of the first 60 students to pass through the program, 52 had matriculated and 39 were studying engineering (23 entered Clemson, of whom 19 were majoring in engineering). In 1981, and perhaps as a result of such success the University more than doubled the size of the program, and expanded its disciplinary and career parameters. Since that time, too, the program has achieved year-round status, enabling staff to provide continuing advice and support to program alumni at Clemson.

11. Univ. of Wisconsin-Parkside

Project CHAMP is directed specifically at underprepared minority high school students, and is designed to increase motivation, to encourage them to take more challenging courses in high school, to strive for appropriate career goals, and to encourage postsecondary study.

Project CHAMP (Creating higher Aspirations and Motivations Program) evolved from a collegiate skills program at UW/Parkside that was designed to assist students meet a requirement (instituted in 1977) of passing competency tests in reading, writing, mathematics, library skills and research skills prior to the completion of 45 college credits It involves workshops for high school students ranging in length from two days (in January, for students preparing to register for their first high school classes) to six weeks (summer), with college personnel following up by talking with students, parents, and high school counselors concerning students' course selections and academic progress.

The summer program provides students with an introduction to courses in which they would be enrolled in the fall semester, hence an advanced orientation to the material. There is an exclusive emphasis on academic subjects, with particular attention to mathematics, English, and science. The purpose of the summer program is to use those basic high school subjects to develop abilities in note taking, listening, textbook reading, time management and test-taking in the context of the disciplines. Toward these ends, subject-specific vocabulary building is stressed, as are discrete core subject-specific processes, e.g. how to write up a lab experiment in science, how to read a poem, etc. A variety of allied motivational strategies are employed, including vocational interest inventories, career seminars, and, most importantly, regular telephone conversations with students, parents, and high school personnel. If an institution cannot support an academic year follow-up program to such a summer experience, why not at least use the telephone for purposes of guidance and encouragement?

The program has been operating since 1979, and hence little evidence of long-term impact on student achievement is available. However, a 1984 survey of 143 current and former CHAMP students indicated a considerable raising of educational aspirations (72% intended to complete the Bachelor's degree), and considerable parental support of those aspirations. Another set of follow-up data suggests that students who have been through the program are more likely to select more demanding academic courses in high school and are accepted in significant numbers in the pre-engineering summer programs of the University of Wisconsin at Madison. In the future, the PSAT will be used, pre and post, to measure the impact of the program on general learned abilities in English and math.

12. La Guardia Community College (New York)

At the Middle College High School, an urban college takes some high risks with higher risk high school students and succeeds within a framework of objectives that are both modest and significant.

Since 1974, the Middle College has been an enclave within La Guardia Community College for 10th-12th grade students identified by high school guidance counselors as potential drop-outs from the system. These students, who exhibit both academic and social instability and poor self-image, are interviewed and admitted to this alternate program by current students.

The concept of the enclave of a high school program on a college campus is not new to American education, but a variety of features of this program are particularly notable. The program stresses personal and career development as a mode of bringing alienated students back into the system, and uses an internship in a community services project (a modified cooperative education model) for one quarter each year. The delivery of the academic program has been designed around this internship and that has necessitated some restructuring of curriculum

(content and objectives of individual courses). For each of the 450 students in the program, the connections between the internship, the academic program, and the college environment are cemented by a faculty supervisor.

While many students in the program earn college credit (and thus shorten the time to the high school diploma or the A.A. degree), that issue is secondary to the development of a sense of the continuum of education and a commitment to learning.

Whereas the expected drop-out rate for this group of students is 40-50%, not only has the actual rate been but 15%, but 85% of the 254 graduates to date have gone on to college.

13. The City College of New York

The Select Program in Science and Engineering at CCNY is a classic high school outreach program directed at involving more minorities in science and engineering, and is perhaps one of the most successful of its kind.

Students are selected for the program in the 10th grade by their own high schools. The selection process is fairly elaborate, and involves a 30 item mathematics test (through Elementary Algebra and some Geometry), and a background questionnaire that provides enough information for high school teachers to determine which of the students who passed the test are economically and educationally disadvantaged (CCNY provides guidelines including zip codes of high density minority areas and tables to determine eligibility for Tuition Assistance).

Some 16 New York City high schools participate in the program. In any calendar year, 8 of those high schools send 30 students each to the CCNY campus for 12 full-day Saturday programs of mathematics, laboratory, career lectures, and counseling. Each week's mathematics session is designed to prepare students for the following week's laboratory session. Reinforced in this carefully articulated manner, student performance on the 30 item mathematics test has consistently improved by about 2/3rds of a Standard Deviation Unit in 12 weeks; and a series of measurements of student attitudes toward math and science has consistently demonstrated a modestly positive impact.

Mathematics is heavily emphasized in this program; and for reasons both practical and academic. If students stick with the sequence (90% do), they can undertake the study of calculus no later than the freshman year of college, and hence be able to attain the B.S. or B.S.E. in four years. Thus, following the Saturday programs, the students are kept together in their high schools for math and science courses in the 11th and 12th grades, are brought back to campus periodically for conferences and laboratory presentations, and are visited by CCNY faculty from participating academic fields.

Of the first group of 175 students who completed the program and graduated from high school, 74 entered college in science and engineering fields. Of this group, 30 completed calculus in high school. After college entrance, though, it is very difficult to follow

the careers of these students to determine the long-range impact of the program.

Although the bureaucratic gauntlet required for such a program is unique to big city school systems, the model is transferrable to non-urban universities with distinctly bounded service districts, and obviously can be directed at majority students as well. In fact, the program is currently being replicated in at least six colleges in the New York Metropolitan area (and one college in London, England) with assistance from CCNY.

14. Muskegon Community College (Michigan)

The Pre-Admission project seeks to anticipate the problem of postsecondary retention through pre-admissions orientation to the nature and demands of college. It thus addresses the kinds of serious misconceptions that high school students have about college and which often result in disillusionment and attrition.

High school counselors select no more than 12 students for a class that is conducted by college staff at area high schools. While it is unclear how often this class meets, the course covers such topics as the relationship between academic programs and careers, college environment and financial aid, and seeks to develop the student's self-concept through group counseling activities based on the Human Potential Seminar method. In conjunction with these ends, the College provides a battery of diagnostic examinations (including the Nelson-Denny Reading Test, the California Occupational Profile, and the College's own placement tests in writing and math) to assist students in assessing their abilities.

A specially designed pre/post assessment yielded mixed results, with the most noticeable improvements in the self-awareness and self-concept area. But minority students improved dramatically in all areas of development addressed by the program.

For students who enter Muskegon Community College itself, this experience has proven value because it provides them with a link to college staff when they arrive. Given the generally recognized traumas associated with the transition to postsecondary education, it is not surprising to find that that link resulted in a 92% retention rate (versus 40% for the institution as a whole) for those students who had taken the program. For students who enter other colleges, the retention rate is 75%, a figure still well above the national average.

15. Xavier University of Louisiana

Project SOAR (Stress on Analytical Reasoning) is a pre-matriculation summer program that seeks to enhance the problem-solving abilities of students who indicate an interest in mathematics, sciences, or the health professions. Based on Piagetian theory, the core of this academic program consists of 25 three-hour laboratory experiments (five each from Biology, Chemistry, Computer Science, Mathematics, and Physics) that stress five of the major components of problem-solving:

- o control of variables;
- o proportional reasoning;
- o probabilistic reasoning;
- o combinatorial reasoning; and
- o recognizing correlations.

Each laboratory is organized in a learning cycle format with exploration, invention, and application phases.

In addition, students engage in a series of activities designed to improve vocabulary, note-taking ability, and ability to visualize in three dimensions (a visual literacy skill required for college level work that is often overlooked).

The program has been in operation since 1977, carries no academic credit, but is available, at no cost for tuition, to all science students accepted at the university (over 100 have matriculated annually since the program began). Benefits to both students and the university are considerable, e.g. the graduation rate of science majors who have been through SOAR is double that for those who have not; pre- and post-tests of formal reasoning show considerable value-added; science enrollments have more than doubled; and placements in graduate science program and medical/dental schools have risen dramatically.

16. University of Illinois at Chicago

The "Early Outreach" program seeks to increase the number of Blacks and Hispanics who will gain access to health professions curricula through regular admissions procedures without extensive remediation. Its long-term strategy is to prepare a gifted pool of economically disadvantaged minority applicants for entry into health professions schools. By providing curriculum enrichment and career guidance starting in the middle school years (grades 6-8), the program seeks to stimulate high school completion, college attendance and a career in the health professions. This "talent ladder plan" reflects the recommendation of the American Association of Medical Colleges that medical schools extend their outreach responsibilities.

Early Outreach programs at the Health Sciences Center of the University involve faculty and tutors, school personnel, parents, health professionals and agency personnel with students who are selected by both academic and non-academic criteria. One of the more unusual of the latter is a constellation of variables called "family support," formulated in the recognition that family commitment is particularly critical to the long preparation period required for careers in the health professions.

The programs involve a Saturday College for 7th and 8th graders, a Career Awareness in the Health Professions program for 10th graders, and a Biomedical Science Program which starts students in the 9th grade. Program evaluation is conducted by an Office of Evaluation Research in the College of Education, and involves a more sophisticated design than is common in many similar programs. Students in Early Outreach have made greater academic gains than those in control groups, and are able

to define their career goals more realistically. Secondary benefits have accrued to the University in the sensitizing of faculty to the talents of this disadvantaged population and in the enhanced stature of the University within its urban community. (ER)

17. Illinois Institute of Technology

Both the Minorities in Engineering and the Chicago Area Health and Medical Careers programs at IIT have a number of distinguishing features. In both cases, the institution's relationship with the student is persistent, continuous and demanding.

The Minorities in Engineering program has been in existence since 1974. High school sophomores and juniors with interests and potential in science and engineering are jointly identified by IIT's program coordinators and high school teachers. A series of selections evidently occurs in the course of program activities over the next three years so that the final group is truly qualified.

During the Sophomore year of high school, students participate in 10 Saturday workshops that focus on career counseling, study habits and skills, and academic advisement (i.e. spelling out what it takes to get from here to there). During the Junior year, approximately 100 students are selected to attend three full day Saturday sessions at the University, working on a "team design Project" with an undergraduate student, and, in the process, learn the norms organization of scientific work. Much as is the case in industry, these teams compete their designs according to pre-agreed criteria. As this project proceeds, Program staff observe the students carefully for purposes of screening into the next program component, a full-time 7 week summer institute during which the competing team project format is repeated, alternated with weeks of career counseling, testing, and practice in report writing.

The Senior Year program brings students to the IIT campus for 16 Saturdays of special tutoring in math for those who need it and a laboratory skills course in physics. In the summer between high school and college, major Chicago corporations hire program students for work related to engineering. Once the student enters IIT (though it is not clear what happens to the 2/3rds of the program graduates who go elsewhere to college) a freshman support component falls into place. This is a combination of a "buddy system" and tutoring program coordinated and staffed by minority student organizations.

Over 90% of the participants in the Summer Program component go on to college, with 75% majoring in science or engineering. The vast majority of these students are black.

The Chicago Area Health and Medical Careers Program, which started up in 1979, was modelled on the older Minorities in Engineering. The major differences lie in the areas of screening, the form of summer internships, and time band of a student's career covered by the program.

CAHMCP is a six year program that takes minority students from the Junior year of high school through registration in a health or medical

professional school. The screening process for CAHMCP occurs principally on entry: high school Juniors must be in the top 20% of their classes, and must have completed courses in mathematics through Advanced Algebra/ Trigonometry and in science including Biology, Chemistry, and Physics. Those requirements are designed to minimize attrition for academic reasons.

Students attend a Junior year program component designed principally to provide an orientation to careers in the health professions, a full-time 7 week summer session (with one week spent in a medical school), and a Saturday program during the Senior high school year that provides supplemental work in math, the sciences and communications and that offers the opportunity to undertake special research projects.

Not all these students subsequently attend IIT (in fact, roughly 25% attend college out-of-state); but the program continues through a series of summer "Preceptorships," paid internships with a physician, medical school, laboratory, clinic or health agency (e.g. the Chicago Board of Health), all accompanied by supplementary tutorials (particularly in communication skills), academic enrichment experiences matched to the student's needs and interests, and training in the process of applying to medical school.

It takes a great deal to implement a program such as this. External funding since 1979 has totalled nearly $2 million, and fund-raising is an ongoing concern of the program administrators. But since nearly 1000 students have participated in one or more components of the program since its inception, and since the retention rate seems to be in the 70% range, the funding efforts are worth the initial results.

18. St. Edwards' University (Texas)

The Migrant Attrition Prevention Program is a rather unique undertaking of a college in relation to a very distinctive population (and its attendant educational problems). Children of migrant laborers--as one can well imagine--receive a very inconsistent and eclectic education, often carry around partial transcripts from a dozen high schools, evidence a high drop-out rate, and are at a severe disadvantage in terms of access to higher education. Texas has over 75,000 "current migrant" students--more than any other state--and the highest ratio of migrant students to total school enrollments (measured by the latter indicator, the problems presented by these students should also be of interest to colleges in Arizona, Arkansas, California, Florida, Idaho, and Washington).

The program brings over 200 of these students to the St. Edwards campus each summer. For students completing the 9th grade, the summer program is an academic one, focusing on basic skills and supplemented by tutoring and counseling. For students completing the 11th and 12th grades, the program involves both study and part-time jobs.

Since 1975, over 2,000 secondary school students (principally Hispanic) have participated, and over 9[illegible] of them have either graduated from high school or are still enrolled in school (a remarkable percentage in light

of the normal attrition rate). Approximately 30 Texas school districts participate in the program (presumably recruiting and recommending students), which, given its obvious expense, is supported by Federal, state, and private (corporate and foundation) grants.

THE EXCHANGE AND DEVELOPMENT OF ACADEMIC PERSONNEL

These are programs directed principally at secondary school teachers in cooperation with college faculty. But they are not in-service education programs; rather, they seek both to enrich the secondary school curriculum through the elimination of redundancies with postsecondary curricula and to heighten the appreciation of pre-collegiate education on the part of college faculty. Impact on students is a decidedly secondary consequence of these projects, and would be extraordinarily difficult to assess anyway.

The most difficult challenge facing these programs is the task of developing working communities out of groups from different professional cultures. One (college faculty) is accustomed to controlling the curriculum, the other (school faculty) is not. School teachers tend to have a fairly unity conception of their professional role, while college faculty frequently evidence the divided sensibilities inherent in their roles as teachers and researchers. The work time of school teachers involves constant contact with students; that of most college professors does not. And school teachers are occasional or regular students themselves—in graduate programs; and are thus dependent on institutions of higher education, whereas college faculty have no analogous personal or professional relationship to schools.

Out of these different work cultures inevitably emerge biases, suspicions and mistrusts. The programs described below provide some promising ways of mitigating those barriers to productive school/college partnerships.

19. Illinois Institute of Technology

The College-High School Teachers Interaction Project (CHIP) and the Illinois State Physics Project, which have now joined, may serve as a model of an informal metropolitan network of science teachers (physics teachers in particular). Operating in four high schools and six colleges, the particular combination of these projects is designed to increase the number of high school students taking physics, to enhance the quality of physics teaching generally, and to establish a permanent working relationship between high school and college physics teachers.

The group meets for 2-3 hours one evening per month, and employs a phenomenological approach to sharing ideas for improving physics instruction. That is, the group actually works through experiments and demonstrations as opposed to listening to dog-and-pony shows. The objective is to find strategies that will arouse student curiosity through a phenomenon, not through a textbook or lecture. "Once the student wants to find the answer(s) to question(s)" implicit in the phenomenon, "we have both emotion as well as intellect on the side of learning." As phenomena are presented, the faculty become students in

order to observe and critique the pedagogy. Subject matter has included the measurement of frequency, measurement of tensile strength, density, rotational motion, polarized light--and virtually any topic that might turn up in high school or freshman college level physics courses.

The program has been operating for 11 years without any extrinsic rewards for participants. This longevity speaks eloquently to its success. But what is necessary to make a project like this work is leadership and time: the former to drive a group and keep it together; the latter to allow intellectual and social bonds to form among group members.

20. Herbert Lehman College/CUNY (New York)

The Writing Teachers' Consortium is a comparatively new program involving faculty development in 28 New York City high schools over a three year period. In each year, 20-30 teachers at each of four high schools are targeted for an intensive program. Both Lehman College faculty and peer high school faculty engage in on-site training, retreats, and summer seminars designed to realize a writing-across-the-curriculum program in each participating high school and to develop local leadership for that program. At the same time, the high school teachers earn graduate credits at Lehman (no doubt an inducement for some). While 12 high schools receive this intensive attention, the results are disseminated to smaller groups of teachers at 16 other high schools.

The assumptions underlying the program are that student writing can best be improved by improving the teaching of writing and that the best teacher of teachers is another teacher, not a transient consultant. The program grew out of the realization that the New York City Writing Project (one of 92 sites of the National Writing Project) was not reaching the average classroom teacher and hence was not evidencing sufficient impact on the school system. Only English teachers were being addressed and there was no effort to build, in each school, a cadre of teachers and administrators who could carry on a joint and mutually-reinforcing effort. Nor was there any attempt to account for diversity in school settings or to involve teachers in the development of materials they were expected to use in those diverse settings.

For the 300 teachers involved in the program, the key objective is to internalize the notion that all learning, as a process, is similar to writing. Nonetheless, participating teachers create course syllabi and instructional materials adapted to fit the unique needs, strengths, and weaknesses of particular schools. They also develop classroom strategies to increase the amount of time students use in writing, speaking and listening to each other. To aid these efforts, ethnographic research on student writing and on teacher/student interaction is constantly being fed into the project.

While the program has been in operation for only a short time and its impact is as yet unmeasured, the follow-up activities of the Consortium staff (observations in schools demonstration lessons in classrooms, research on the impact of different approaches to the teaching of

writing) promise to provide a rich body of information for similar undertakings elsewhere.

21. California Council for the Humanities (San Francisco)

A variation on the concept of the National Humanities Faculty, "Humanists in the Schools" is a program that is designed to link schools, universities, and other local institutions (libraries, museums, theatres, etc.) in a partnership for the enhancement of education. It places university humanities faculty in public school classrooms for long-term residencies designed to strengthen such areas of curriculum as literature, art history, classics, and history. Like the National Humanities Faculty model, this continuing and reinforcing relationship emphasizes the teaching of the humanities as disciplines, skills and value systems, and transcends the relationship of consultant/client by insuring that all participants are colleagues.

The initiative lies with the local school district, which applies to the California Council for the Humanities for a grant to employ a university faculty member to work with a teacher team for at least one semester per year. A project is developed, special classroom sessions are conducted by the team, and students are involved in both research and other activities with community cultural and civic organizations. In addition, the visiting university faculty member offers intensive seminars with school teachers.

The program has been in operation for five years in three major school districts. Some ten (10) schools, 100 teachers, 16,000 students, 16,000 parents, and others have participated directly in the resulting activities. Again, as inspired by the National Humanities Faculty model, this is a striking alternative to traditional in-service teacher education. While it is difficult to evaluate a program such as this, the extant information concerning its impact on other developments in the three school districts is encouraging.

22. University of Pennsylvania (and 70 others)

The Program in Strengthening the Humanities through Foreign Language and Literature Studies is an analogue of the Illinois State Physics/CHIP project (see #19 above) on a national scale. While comparatively new, it is worth remarking on in these pages because it is informed by a model of professionalization that can be applied to the entire teaching enterprise.

The model is that of the county medical society. As adapted by education, that model allows for the vertical organization of practicing professionals in a discipline from elementary to graduate school. That foreign language education is a comparatively easy field in which to apply the model--because the essence of the subject matter is essentially the same on the elementary, secondary, and postsecondary levels--should not detract from the broader implications of this approach to organizing and improving a profession.

First piloted in three locations in 1981, the collaboratives" (as they are called) provide opportunities for teachers to keep current with scholarly and pedagogical literature through a process of active sharing and to plan improvements (e.g. in second language proficiency testing) in foreign language education at participating schools and colleges in the area. Monthly meetings with panel discussions, demonstration classes and other approaches serve to advance a collective sense of purpose and professional development.

A considerable sum of soft money from various sources has enabled the initial experiment to expand--via competition--to some 70 collaboratives in 36 states involving over 2000 foreign language instructors. The program is coordinated at the University of Pennsylvania, which is encouraging each of the 70 collaboratives both to replicate itself within five years and to stimulate parallel development among English and history instructors.

23. University of California at Irvine

"I Love Science" is not so much a program as a constellation of activities in which college faculty assist elementary and secondary school teachers in (a) updating their knowledge and skills so that science curricula can be more current, and (b) introducing more complex and highly motivating science materials at earlier points in the schooling process than the 10th grade.

To these ends, the University offers a science minicourse to elementary school teachers focusing on scientific content and the process of scientific inquiry. The Chemistry sequence, for example, emphasizes the concepts and characteristics of the elements so that they may become more prominent in elementary school science education. In a Saturday "Science Clinic," both presentations on current research and laboratory tours are designed to provide teachers more confidence in their subject matter knowledge. A parallel "Saturdays for Science" course on "Molecules Around Us" is offered to 4th, 5th and 6th graders by University faculty.

Lastly, the University and local industry support a 5-week summer program modelled on the now-defunct NSF Summer Science Institutes for middle and secondary school teachers. A "Modern Unified Science" course stressing the teaching of basic physics and chemistry (and including laboratories and examinations) and a "Special Topics" course form the core of this summer program. The latter allows teachers the "excitement" of "peeking in," as one participant put it, on frontier areas of research such as psychobiology.

What did it take to plan and implement this program? Two years of meetings with high school science teachers, extensive interviews with students, corporate contributions sufficient to fund half the cost of the Summer Science Institute, strong administrative support from the University, and a conviction on the part of faculty intense enough to sustain the effort.

PART B:

THE FRESHMAN YEAR: THE RITE OF PASSAGE

One of the Commission's most notable moments of testimony was offered by Lois Mazzuca, then president of the National Association of College Admissions Counselors, at the public hearing on "College Admissions and the Transition to Postsecondary Education" on June 23, 1982 in Chicago. Comparing our "domesticated rite of passage" with those in other societies, she remarked that

> "Young people nearing the time of career choice or [high school] graduation thrash about with questions they are no more prepared to answer than they are ready to pilot an airplane or practice law. When students come into our offices, they do not know what they do not know--they are asked [by the colleges] to declare a major for a field they know nothing about, choose a school from pictures in brochures, sort through an alphabet maze of acronyms and fill out form after form for a career they probably will not enter five years down the line."

It is no wonder that, as some very wise college students themselves remarked to us the following morning, the greatest challenge for the college freshman of traditional age is the establishment of an academic and personal identity.

How well do colleges understand that challenge? How well do they understand who their entering freshmen really are, what assumptions about education and its "scene" they bring with them, what learning behaviors they have inherited, and what pressures they feel as young adults seeking a path to the future? Our rite of passage is indeed a difficult one, fraught with ignorance and uncertainty. In order for colleges to make that first transitional year a productive one, in order for them to establish the kinds of programs that will assist freshmen in adapting to a changed environment and its demands, they have to look at their entering freshmen in three dimensions. While it is difficult to characterize the "typical" entering freshman, the principal author's own research suggested some traits and attitudes we had hoped to see addressed in freshman year programs and which were also implicit in Ms. Mazzuca's testimony:

> 1) Entering freshmen have great difficulty in perceiving any proprietary interest in learning beyond the diploma or major that will render them employable--or so they believe. This lack of a sense of ownership of one's education precludes students from belonging to a community of learners. As high school students, their ideal image of college is often a fantasy of seminars with professors who will love them as intellectual human beings and with whom they will talk about deep subjects and unknown territories. But that image is often exploded on matriculation, when they discover many colleges to be nothing more than large high schools and their "professors" to be graduate assistants who are here one semester and gone the next. The resulting confusion is likely to

be reinforced by a fragmented General Education curriculum that, in many institutions, asks for little that is unknown.

2) There is no real break with the adversarial relationship between students and teachers to which entering freshmen have been conditioned over 12 previous years of schooling. Observers of freshman classes testify to a significant amount of gaming behavior in which students either trivialize learning (and hence sabotage the instructor) or develop a set of instructor-oriented expectations based on a knowledge of the instructor's background and style.

3) We have also noticed that entering freshmen tend to assume that the instructor is sole repository of judgment, thus blocking the development of their own skills of self-evaluation. For example, students confuse requests for information with judgments; and will translate affective statements by an instructor as orders, e.g. "I feel" becomes "you will!" No doubt this behavior is also the result of inherited role expectations.

4) The only reason they speak in class, some college freshmen say, is to impress, not to express; and they equate frequency of participation with influence. Entering freshmen do not believe anyone else will accept the validity of their real interests, so rarely express them. But without natural expression, the goal of a learning community becomes more elusive.

5) We see in too many freshmen a combination of cynicism and passivity reflected in a question that takes one of two forms: "What does it take to get by?" or "How do I get the highest possible grade with the least amount of work?" If college instructors observe this tendency to increase in the second semester of the freshman year, then they should know that this inherited game has already been reinforced by the style of other freshman year courses.

6) Far more seriously in terms of the goals of postsecondary education and the nature of the workplace, entering college freshmen evidence a high degree of discomfort with ambiguity and complexity. This trait precludes productive work in groups (which employers expect of college graduates) because group learning requires those tolerances. Despite their tendency to generalize perceptions, students exhibit an impatience with abstract topics, and rush to lessen their anxiety about learning by translating those topics into recognizable form. These tendencies indicate a low degree of intellectual risk-taking.

With all of that, it should thus not surprise us that freshmen turn to the most easily accessible structure in a college in which to negotiate academic and personal identity for themselves--the major. We place high pressure on our freshmen to specialize on entrance to college; but that pressure proceeds as much from the internal drive for academic identity as it does from the external forces of vocationalism. The unhappy irony, though, is that the early declaration of major isolates students in the

security of a program before they have confronted self, the social and moral roles of education, or options and values in the disciplines. The irony becomes unhappier still when the students in question are underprepared. Postsecondary learning beyond the major thus becomes an uninspiring rite of passage.

Now, because the issues involved in the transition to postsecondary education are far more complex than what is described above, we did not specifically list them in the material through which we solicited program profiles. As it turned out, however, the Commission received many profiles addressing "lower division," "General Education," remedial education, and adaptation aspects of the college experience. We have already cited some programs that operate on both sides of the boundary between secondary and postsecondary education; and there are others--serving principally freshmen--which better illustrate such topics on our agenda as Retention and Academic Work or Competing Models of General Education. Indeed, some of these programs demonstrate very creative solutions to the problems of academic identity suggested above.

But this section treats roughly a dozen programs focused almost exclusively on the freshman year and on problems of adaptation to postsecondary environments and academic demands.

24. University of South Carolina

University 101 is an extraordinarily successful and widely replicated (there are approximately two dozen variations in colleges throughout the U.S. and Canada) approach to the problem of acclimating entering freshmen to the idea of the university and the demands of higher education. The program simultaneously provides special preparation for faculty so as to render them more aware of and sensitive to the learning and development problems of entering freshmen and offers a course that combines institutional orientation, academic materials, communications and listening skills exercises, and problem-solving.

In the process, the program attempts to address some of the debilitating inherited assumptions about education and instructors that we cited in the introduction to this section. Professors become people, not adversaries; and students are brought to an understanding of the university as a organization that helps them function within it to their maximum advantage in terms of both academic and personal growth.

Approximately 1/3rd of the freshman class takes University 101 each year, and special sections are offered to unique populations such as older (over 25) students, undeclared majors, nursing students, Upward Bound students, and handicapped students.

While the approach to the essential material (e.g. study skills, college survival) varies widely from instructor to instructor, the overall objectives do not. Established in 1972 and carefully researched, the program can demonstrate that participation is positively correlated with a significantly higher retention rate, even for those who are initially less well qualified than students who did not take the course.

In what is a particularly intriguing secondary benefit of the program, the University has established a parallel "course" for new faculty and staff.

25. SUNY at Plattsburgh (New York)

The research literature on college attrition indicates the necessity for integrating both social and academic aspects of the transition so as to help students find and achieve a productive "fit" between themselves and the collegiate environment. Drawing on the many clues and conclusions offered by the research, and informed by the University 101 efforts at the Univ. of South Carolina (see above), SUNY/Plattsburgh developed an experimental, voluntary freshman seminar designed to help students clarify educational and personal goals, to increase faculty-student contact, to develop both oral and written communications skills, and to increase students' understanding of the nature and purpose of college curriculum.

The document submitted provides few details of what is actually done in the seminar: each faculty member chooses a topic, e.g. "Aging in American Society"; classes are limited to 15 students and are often conducted in unusual times and places; and the emphasis in classroom processes is on discussion. That's all we know. While faculty employed a research design to measure the impact of the course, the results are inconclusive, and perhaps illustrate an old adage that you can't domesticate a tiger by pulling out one claw at a time, i.e. it is a rare phenomenon for one course to change a student.

What was more interesting, though, was a bimodal pattern in student evaluations of their Freshman Seminars. While students reported significant contact with faculty and significant improvement in communication skills, the seminar evidently had less impact on clarification of educational, personal and career goals. The program administrators hypothesize that this pattern reflects faculty values and behaviors, and might be rectified through a common curriculum for all sections.

26. New School for Social Research (New York)

Historically, the New School has served adult populations, so one does not associate it with traditional college freshmen. But since 1972, the New School has operated a special, wholly self-contained Freshman Year Program consisting exclusively of a series of seminars designed to explore the questions, concepts and methods characteristic of the major academic disciplines. Students in this program are "non-traditional," but in a different sense than our current usage of that term implies: more than half the students in the program enroll as freshmen immediately following Grade 11 and without completing high school (it may surprise some to learn that students in the Freshman Year Program come from over 200 high schools in 22 states). To be admitted, though, they must demonstrate "sufficient preparation to do honors level work," e.g. Calculus is the only math course offered in the Freshman Year Program.

The "freshman seminar" is not a new concept in American higher education, but the topics of the New School seminars have the ring of upper-division courses (e.g. "The Federalist Papers and Contemporary Politics," "Freud's Concept of the Mind," "Between God and Beast: the Literature of Metamorphosis," "Matter, Energy and Form: the Thermodynamics of Living and Non-Living Systems"). In addition, foreign languages are taught in an intensive 3½ hour period on Saturday mornings, with heavy emphasis on the audio-lingual method and the experience of the culture of the language. Nonetheless, it is the manner of instruction and disciplined inquiry, not the title or subject matter, that seems to mark the objectives of this program. There are no lectures and no lowest-common-denominator-surveys. What is more to the point, though, is that the entire freshman year is taken up with these courses.

The material provided to the Commission offered no detail concerning the impact of the program on either students or faculty. But there is no question that the tenor of the program is in keeping with its institutional culture.

27. Illinois Central College, et al

Project COMPAS is a particularly noteworthy cooperative effort of seven (7) community colleges in four (4) states to clarify the roles and expectations of teachers and beginning college students in the classroom. Seven distinct academic programs directed at developing operational reasoning and the capacity for abstract thought through Piagetian sequences are offered by 40 teachers in six standard content areas: English, history, sociology, mathematics, economics, and physics.

What does that mean? When, in the course of lectures, college faculty offer generalizations and theory and students do not appear to understand, it may be because they do not possess the concepts from which theory is constructed (let alone the concepts that underlie methodologies). Since these concepts are derived from common experience, the COMPAS approach holds, common experiences should be required of students to generate, hence internalize, the concepts. The example used was a classroom exercise in generating the Law of Diminishing Returns in economics. A simulated production table was set up, with one student--then two, then ten, then two dozen-- making widgets out of paper while the others recorded the rate of production. If the "learning cycle" model is followed in this type of exercise, students are then asked to analyze the experience and the recorded data, to produce their own generalizations, and then to apply one or more of those generalizations in a new situation. This process obviously has much in common with the phenomenological approach to the teaching of physics evidenced in project CHIP (#19), and in the "Learning Cycle Laboratory" in chemistry (#69).

The 200 participating students in 1981-1982 were of average ability. All were specially recruited; but the kind of freshmen sought were not those who are uncomfortable with group learning, ambiguity and complexity, i.e. who did not exhibit the attitudes and behaviors we cited at the outset of this section. Recruiting has proven very

difficult, precisely because it is hard to explain the program to "typical" low-intellectual-risk-taking freshmen. Indeed, at one site, where students were placed, not recruited, there was tremendous student suspicion and reluctance to participate. Perhaps that phenomenon argues that the program ought to be extended to the more "typical" freshman. But for that to happen, the sites need to involve more faculty in a risk-taking enterprise of their own.

Since its inception at Illinois Central in 1976, the project has been carefully monitored and evaluated. Student cognitive development has been shown to be positively affected, though the magnitude of change differs by site, and seems to be related to the degree of total immersion of students in these specially designed courses.

28. Bloomfield College (New Jersey)

Like Project COMPAS, this is a notable freshman year effort inspired by Piagetian theory and directed principally at developing students' analytical reasoning and communication skills. It is a multi-level Freshman Core Program that redefines General Education in terms of cognitive skills. This common goal, persistent focus, and sound theoretical base is important in providing freshmen with a critical sense of the coherence of higher education.

Traditional subject matter is recast in terms of the processes of attention, selection, analysis, modelling, application in problem-solving and communication. The Program admits that the view of intelligence implicit in this approach "is probably too narrow," as it excludes synthetic thinking, for example. But it is probably well limited in terms of a student constituency with a median age of 30, comparatively low scores on SATs, and a past history of unsuccessful attempts at postsecondary education.

The program has been in existence since 1974. It involves a goodly dose of diagnostic intake testing and ability grouping of students within two sets of Core courses in Social Sciences/Humanities and Mathematics/Natural Sciences. Basic skills workshops accompany each course, but they are not optional supplements--they are required until students reach designated levels of proficiency.

The demands on both faculty and students are extraordinarily high, e.g. each course involves 5-7 contact hours per week; the Social Science/Humanities courses require 26 papers per student per semester; and faculty meet weekly to establish common assignments and evaluate course progress.

Success? The measurements vary, but the outcomes are promising. For example, in a remedial math course emphasizing quantitative reasoning, students registered an average gain on standardized tests of three years in one semester v. less than one year for students in parallel courses that did not use the cognitive skills approach. Morale of participating faculty is extraordinarily high and they have become leaders in the

improvement of teaching and curriculum across the college. The Program has also had a positive impact on both retention and transfer rates.

29. St. Edward's University (Texas)

The particular importance of listening as an information processing skill in higher education has been generally neglected, even though students spend 45% of their academic time in listening. It is clear that part of the process of acclimating freshmen (particularly those weak in language skills) to college should involve training in listening.

The Directed Listening Skills project at St. Edward's is part of a special interdisciplinary General Studies and writing program for freshmen. It is a course operated in conjunction with an existing system of basic skills laboratories and uses a mastery learning model. Students are selected on the basis of scores on diagnostic examinations (which are later used for post-tests). Many of the students in the program are not native speakers of English.

What is done in a listening lab? Principally, exercises in focused attention, ways to cut through the medium to the message. For example, students are arranged in small groups, with each member required to read a newspaper article aloud and subsequently question other members of the group concerning its content. Tapes of stories read in dialect or heavy accents are accompanied by guided questions that force the attention to content. And something called "the Dow test," which requires students to distinguish major ideas and details in films, is regularly used.

Follow up on over 500 students who have taken the course since 1979 demonstrates that not only did their listening skills (as measured by the Brown-Carlsen Listening Comprehension Test) increase far more than those of control groups, but also that they demonstrate greater increases in GPA, credits earned, and positive attitudes toward themselves and their academic futures.

30. University of Nebraska at Omaha

The Goodrich Scholarship Program combines characteristics of both remedial and pluralistic models of educational opportunity. It recruits students traditionally denied access to college, provides them tuition waivers, offers supportive services to enhance their skills and confidence for successful completion of the baccalaureate, and requires them to complete a general education component involving a "culturally sensitive" interdisciplinary curriculum. The program was designed to make rigorous intellectual demands on its students, on the premise that low-income students have the same capacity for academic achievement as others, provided they are sufficiently challenged.

The Goodrich Program requires a special set of two courses each semester in the freshman and sophomore years. The freshman courses emphasize academic skills and the humanities; sophomore courses focus on tools of social science research, urban problems and public policy. Given the objectives of the program, we found it paradoxical that science and math

were not given a similar treatment. There is no Goodrich curriculum for the junior and senior years, but support services and non-credit activities are available to all students in the program.

Faculty and graduate assistants, who combine teaching and counseling roles, provide continuity for the students. Program faculty hold courtesy appointments in the department of their specialty; and all were selected for their commitment to this type of experimental undertaking as well as for their academic credentials.

The program has been in operation since 1972, and its present enrollment is approximately 270 (of which 60% are minorities). Goodrich students are "non-traditional" in a variety of ways, and have included public assistance recipients, those who are incarcerated or on educational release, and those who do not possess traditional academic credentials for college admissions.

Recent evaluation studies indicate that Goodrich students performed above average in their Program courses and about average in non-program courses. Findings with respect to correlation between composite ACT scores and cumulative GPA after two years in college show a statistically significant association, but also indicate, e.g. that 71% in the low ACT range had cumulative GPA's of 2.0 or better. (ER)

31. Pace University (New York)

The Challenge to Achievement program at Pace enrolls selected underachievers in a carefully articulated freshman year program. CAP evolved from a provisional matriculation program at Pace in the 1960's, and, following a number of academic modifications, began operation in 1978.

The Program takes its form from the old idea of the freshman year as a complete experience, rather than two disjointed semesters. It assumes that this particular group of students needs time to mature, academically and socially, and a visible structure within which to do so. It also assumes that out-of-classroom help should be directly linked to realistically graded classes.

Limited to 230 students, the Program operates its own set of credit-bearing small courses, including 11 credit hours of English (as opposed to 8 for a regular freshman), and requires a set program of all participants, one that emphasizes history, biology, and math in addition to English. This strategy precludes the sense of bewilderment that freshmen express when they first encounter the wilderness of college course offerings.

It is difficult to determine much about the success of the program given the measures presented in the profile. The graduation rate (within 6 years of entrance) for CAP students currently stands at 39%, compared to 56% for the University as a whole, but it is hard to tell what that means. (ER)

PART C:

RETENTION AND ACADEMIC WORK

While persistence is a means to learning, we too often judge it as an end in itself. Our terms for those judgments are "retention" and "attrition," two sides of the same statistical coin. Even if we were interested only in gross data, we would need to take into account both student intentions and time-to-degree to help us judge retention rates in a voluntary system of higher education. If a freshman indicates a goal of receiving the Bachelor's degree within 5-6 years of entering college, and subsequently drops out after one or two years (or the equivalent in credits), then we have an attrition problem; but if no such goal is indicated, we may not have that problem.

The National Longitudinal Survey data on the High School Class of 1972 demonstrate that 53.% of those who entered college (two-year or four-year) with the intention of receiving a Bachelor's degree actually achieved their goal within 7½ years of high school graduation. One can argue whether 7½ years is a reasonable period within which to complete a Bachelor's degree, particularly as part-time college study becomes the norm. One can certainly argue that our system of data gathering does not allow us to figure out what percentage of the "drop outs" are "recovered" by other types of educational programs or by the higher education system itself 5 or 10 years later. And other data bases (e.g. that of the Cooperative Institutional Research Project of ACE) strongly indicate that students who begin their college careers as full-time students in four-year institutions are far more likely to achieve the Bachelor's degree than those who meet neither condition. Nonetheless, the data suggest that if we regard persistence as a major educational outcome, we have a retention problem in American higher education.

Individual colleges and community colleges are concerned with retention for a number of reasons, some to do with student learning and others to do with maintaining enrollments. It is to their credit that most of the programs reviewed in this section seem driven principally by their concern for student learning. In the main, they see persistence as reflecting motivation and aspiration. More than that, they see persistence as the result of an involvement in learning that is strong enough to withstand other environmental and personal pressures on a student, be he or she full or part-time, traditional age or adult. And even more, they recognize that it is the quality and intensity of involvement in a student's first experiences in an institution that make the greatest difference in terms of retention. While we were thus tempted to classify many of these programs under "The Freshman Year" (see Section B above), not all of them deal with "freshmen" per se. Retention, the reader will discover, has many faces.

Any approach to increasing retention that is based on the quality and intensity of involvement in learning results in a programmatic focus on the nature of academic work. And, in many respects, "work" is what it is, the regular execution of different kinds of tasks to achieve specific ends. The ability to exercise developed skills to bear on those tasks and the serious desire to do so, is what many of these

programs address. Since these abilities and desires are basic to education, it is not surprising that the subject population in most of the programs reviewed here is classified as "developmental" or "remedial." Retention is about tactics to develop academic work skills and de facto workplace attitudes in these students. The programs all recognize that if all we do is to make students feel good, if all--or most--of what we offer in special programs directed toward a potential attrition problem is affective learning, the chances for a measurable impact on the skills and sweat that yield productive knowledge are [illegible].

In her commissioned paper for the National Commission on Excellence, Deborah Stipek of UCLA suggested that the characteristics of the pre-school age learner, who has internalized the rewards of discovery, "seem ideally suited for academic excellence in college," and went on to delineate a number of ways to reinforce those characteristics: value-added measures, mastery learning, and the freedom to make mistakes. The principal problem with the retention strategies reflected in these profiles is that they do not provide for the freedom to make mistakes. And yet that freedom is critical to internalizing the rewards of learning, and hence adding an affective dimension to the otherwise bloodless--but necessary-- efficiency of academic work.

32. Bronx Community College (New York)

The Bronx Community College approach to retention is embracing and systematic, involving reform of institutional processes, change in the institutional environment, and a high degree of consciousness of the elements of academic work.

Most de facto open-enrollment colleges (community colleges, many state colleges) know that there is a group of students who enroll for a full load of courses but do not attend classes. They are not serious students; and Bronx Community College felt that in order to improve the academic environment of the college, the first task was to get rid of students who simply hung around. In 1979, a system was devised for the automatic dropping of students who either do not attend class at all during the first three weeks of a term or attend sporadically and do not attend at all in the fourth and fifth week. Such a step took great courage in an institution funded by enrollment-driven formulas. Indeed, FTE enrollment dropped nearly 20% in the semester following implementation of the policy. But the fact that FTE enrollment has since returned to its previous level indicates that the message--reinforced by a new freshman orientation program--has taken hold: students are more serious (a prerequisite for retention) and the college can devote its energies to their learning.

The attendance problem was but the first step. A Learning Resource Center added computer-assisted-instruction in Chemistry, Physics, and Nursing (and is in the process of extending the CAI program to Mathematics and Biology). Each department developed a tutorial program. Advisement was centralized for first semester freshmen to insure that they received course schedules of preference--a very important move that most institutions overlook. That is, freshmen are likely to become

discouraged (and hence, more likely to drop out of college) when they are treated as the bottom of the barrel at registration.

But a schedule of preference means little unless the courses are realistic; and to the end of matching student abilities and learning needs to courses, an elaborate diagnostic testing program was initiated in 1978. Each department was then asked to review its entry level courses in terms of the academic competencies and skills measured by the examinations. As a result, it is possible to place remedial students in course packages according to their abilities, and preclude them from registering for courses requiring skill levels above those for which they were tested.

While a special remedial course program was put in place, BCC does not abandon those students who pass through the remedial courses into the regular curriculum. The faculty in the disciplinary departments have been trained to reinforce and extend students' communications skills in a manner analogous to the writing-across-the-curriculum models.

Results? The college is justly interested in rate-of-progress toward the degree as it is in retention per se; and a formula involving GPA and numbers of credits attempted determines students "in good academic standing." Since the program was initiated in 1979-1980, the percentage of students meeting those criteria has risen from 67.6% to 73.8%, and the percentage of students suspended has declined from 19.2% to 14.3%. These are promising trajectories, and, given the comprehensive approach employed by the College, are bound to evidence further gains.

33. University of Minnesota

The General College of the University of Minnesota has been in existence since 1932. It is one of 22 undergraduate colleges in the University, and its distinctive mission has been to address the needs of open admissions students who would not be well served by the other colleges. It offers a variety of certificate and degree programs--both Associate and Bachelors. Despite such options, retention is a particular problem among first year students, and even more so among first year minority students. A 1978 study revealed that despite the availability of special skills courses and tutorials, the drop-out rate among underprepared minority students was nearly 50%.

These students dropped out for reasons that subsume deficiencies in previous preparation but that go far beyond that rather conventional analysis. They were students with less specific goals (educational or career) than other freshmen; they were less likely to participate in or form peer study groups or to seek and use supportive services; they were less likely to perceive any relationship between academic subject matter and their life experiences; and they evidenced great difficulty in both managing their time and in coping with the complexity of a large university. In short, they were fairly well alienated from the processes and culture of the institution.

The program developed by the General College to respond to this analysis may be considered controversial by some: separate, full academic-year

plans (courses, modules, support services and tutorials) were developed for each of four racial minority groups (Black, Asian, Amerind, and Chicano), along with a multi-racial plan directed at high risk white or minority students who are low-income, first-generation, or handicapped. The theory is that courses in language skills directed at a homogeneous group will be more productive, that modules using materials from literature and the social sciences to explore the cultural values of an ethnic group will engage students' imaginative sympathies, and that tutorial and support services provided by appropriate ethnic personnel all will have positive effects. To reinforce those anticipated effects, each of these "packages" is "delivered" by a teaching team, assisted by an advisory committee that recruits both students and minority faculty to the enterprise.

The General College refers to this approach as an initial "sheltering," but expects that by the end of the freshman year, the student will have been "mainstreamed," i.e. moved into ever increasing numbers of courses in the regular curriculum and with reduced dependence on the special program.

In terms of retention data on these alienated students, the approach seems to work. General College students who are not in the program (about 3300) have a 70% retention rate through the first year of college. Students in the racial/ethnic plans evidence a 79% retention rate; and students in the special multi-racial plan (approximately 1/3rd of the 300 program students) showed an 84% retention rate. More to the point, as a two-year evaluation study recently demonstrated, the retention rates of high-risk minority students increased dramatically. Across the entire set of packages, the College is holding 55% of the students to the senior year. While that percentage is a bit below what appears to be the national average for students who enter four-year institutions, it is remarkable in light of the significant disadvantages under which these students enter.

34. University of Calif. at Berkeley

Retention has many faces and objectives. Helping students persist to the attainment of a degree is one. Helping them to persist in a demanding academic program of their choice is another; and it is this second notion of retention that is well illustrated by the Math/Science Workshop of the Professional Development Program at UC/Berkeley.

The program is directed at entering black and Chicano freshmen who wish to pursue degrees and careers in science, engineering and other mathematics-based fields. The most significant barrier for these students--most of whom come from high schools that are mediocre, at best, in mathematics and science education--is a one year Calculus sequence. Prior to the creation of the Math/Science Workshop in 1978, 25% of the minority students dropped out of the sequence in the first quarter, and the average grades of those who remained were below 2.0 (the minimum acceptable level at the University). With data like that, the chances of program retention are low, indeed.

The Professional Development Program staff analyzed the situation and offered a number of plausible hypotheses, some fairly standard, some not-so-standard (but, as other reviews in this section show, increasingly cited by sensitive and skilled observers). Minority students, they concluded:

- o enter college with less exposure to mathematics than others;
- o tend to overestimate their understanding in mathematics, hence prepare less for classes (a sad inheritance of experience in high schools with low academic standards);
- o do not manage discretionary time effectively for study and are unaccustomed to the pace and intensity of math and science courses in a major university;
- o rarely study with their classmates--even fellow minority classmates--thus isolating themselves from informal and supportive learning communities that have proven to have powerful and positive effects on academic achievement;
- o have unrealistic perceptions of academic requirements and social norms in a university setting; and
- o misunderstand and mistrust such supportive services as counseling, advisement, and tutoring--even those services designed specifically for minorities (another tragic heritage of poor high schools).

Each component of the Math/Science workshop is designed to address one or more of these problems. The overriding strategy, though, is to create formal communities of learners, "study groups," that are established even before freshman classes begin, and that demand 15 hours per week in academic and social activities. The processes of these study groups are designed to develop self-sufficiency in students; and the time spent becomes more productive through a greater quality of effort. Students who have to work together to squeeze concepts out of primary material play instructional roles; and the master learner is always the most efficient learner. As a significant by-product, students are simultaneously acculturated to the norms of group work they will later find in industry and research laboratories.

The Workshop also includes an intense interview with staff during orientation period in which all the unrealistic expectations and inflated self-assessments are exploded, and an appropriate overall academic plan designed for each student. Needless to say, students are carefully monitored from that point on: by sophomores who serve as "buddies," by Workshop staff, and by classroom instructors. And supplementary instruction in reading the technical language of texts and in learning standard mathematical forms for homework and lab assignments is required. The tenor of this instruction is hardly remedial; and to reinforce that approach, students are placed only in courses for which they have adequate preparation.

The results of this carefully thought-through effort are impressive. The performance of Black and Chicano Workshop students in the Calculus sequence has leaped nearly a full point on the 4.0 GPA scale, and remains a full point above the performance of non-workshop minority students. By the second semester of the Calculus sequence, Workshop

participants' average GPA is 3.0, a grade equal to or greater than that of their non-minority classmates. The attrition rate for Workshop students in the Calculus sequence since 1979 has been less than 2%.

From the perspective of retention more broadly conceived, PDP staff note that "the proportion of Black and Chicano Workshop students completing four and seven academic terms at Berkeley is higher than that of both their minority and their non-minority classmates." And the proportion of Workshop students completing their tenth term is higher than the mean for all Berkeley undergraduates.

What is also promising about this program is its attempt to link up with high schools in order to draw promising minority students into the pipeline. The efforts go beyond "outreach" (as described in Part A) to exemplary case. It is not surprising, then, that other programs, modelled on PDP, have been developed at the University of Michigan, Dartmouth, and other campuses of the University of California.

35. University of West Florida

Retention has many faces and objectives. Yet another retention strategy applies to the student who transfers from a community college to a four year institution. Science programs present special problems for these transfer students, since junior and senior level courses build extensively and directly on material taught in the first two years of college. The Chemistry Department of the University of West Florida (until very recently, a wholly upper-division, two-year institution) has developed a program for students with varied preparation who transfer from community colleges.

The Department has been a leader in community college/university articulation in the state, working with two-year college faculty to improve curriculum and instruction and counseling community college students who wish to major in Chemistry, inviting them to open houses, and offering them a standing opportunity to use the University laboratories. The preparation of entering students has improved, and their transition to the university has been facilitated.

However, community college students who do not choose a Chemistry major until their second year are inadequately prepared when they enter the upper division. In fact, if they lack prerequisite courses in organic chemistry, mathematics and physics, it is impossible for them to graduate in two years. To address that problem--and to anticipate and preclude attrition--the Department uses a number of de facto "catch-up" strategies. These emphasize laboratory use and access; assistance from student instrument technicians; a course in "Chemical Calculations Using a Microcomputer"; the mastery and use of technical literature; the writing of 14-18 laboratory reports per course (with 25% of the grades on those reports being based on the quality of writing); and an instructional practice by which the first lecture sessions in each upper division course cover an extensive review of lower level course material, particularly in organic and physical chemistry.

As a result of these steps, over 90% of the transfer students graduate with a B.S.; 90% of these receive A.C.S. certified degrees, and 45% (versus a national average of 25%) are accepted into graduate programs. (ER)

36. University of Redlands (Calif.)

Retention applies to different populations. One population of growing importance to higher education is composed of working adults. And in programs held at off-campus sites for working adults, the quality of teaching faculty is critical to student involvement, hence retention.

The Whitehead Center for Lifelong Learning, a division of the University of Redlands, serves over 1000 adults in six Bachelors and Masters degree programs. While students traditionally evaluated the programs well, the attrition rates were appalling. For 1978, for example, 52% of the first-year enrollees in the Management programs dropped out, as did 30% of the first-year students in the M.A. in Education program. This disturbing trend resulted in two studies that looked more carefully at student opinion, and allowed program staff to conclude that the qualifications of instructors and the quality of teaching were not judged very favorably by students in comparison to other factors that normally encourage persistence for this particular constituency (e.g. course content, convenience, time scope, use of work project).

What resulted was a program for faculty selection and evaluation. It was established that the instructors most likely to be successful in this program were those who were: (1) masters of group processes; (2) strong in writing skills; (3) both decisive and tactful; (4) capable of motivating--but not overawing--students; and (5) both patient and supportive. How does one find faculty who both know their subject matter and possess these attributes? First, Redlands uses a four-hour assessment, in which groups of 20-30 candidates are involved in exercises including writing responses to student research proposals, leaderless discussions, and personal interviews. Following appointment, there is a training process (though it was difficult to determine precisely what goes on in this "training"); and every faculty member is evaluated by students at the conclusion of every course.

The results are difficult to attribute directly to changes in faculty hiring policy, but they are significant: within two years of implementing the selection process, the attrition rate dropped from 52% to 27% in Management, and from 30% to 20% in Education. Overall, the undergraduate program completion rate is now 80%--an impressive figure by any criteria.

37. Penn Valley Community College (Missouri)

Retention is a particular problem for the non-native speaker of English--not merely because of the language barrier but also due to socio-cultural difficulties in adapting to the college environment. As the Penn Valley staff notes, these students tend to overestimate their abilities in English and underestimate the demands of a community college degree program. Furthermore, the language barrier is doubly

complicating, as it hides the critical support service levers--counseling, tutoring--from the students who need those services most. As a consequence, the attrition rate is very high (though exactly how high was not indicated in the profile we received).

One of the critical issues in retention is identifying the vulnerable student. At Penn Valley, all language minority students are identified and tracked by computer so that their status is known at all times. The Limited English Speaking Ability program (LESA) can thus recruit more effectively (though we are told that most of the students taking advantage of the program do so on a walk-in basis).

The LESA program focuses foremost on language skills, and uses something very much akin to the total immersion approach: 26 hours per week of instruction in the four language skills, by ability grouping, and in combinations of classroom instruction and one-on-one tutorials. What are known in the research literature as Cognitive Academic Language skills are stressed over grammar. In addition, there is a particular focus on assisting students in history, speech and composition courses, all of which require a high degree of English language proficiency, and all of which are required for the degree at Penn Valley. This emphasis places high demands on a tutorial program, which comes to the aid of students only after they have passed the immediate level ESL course, Tutorial sessions may involve discussions of long passages in textbooks, pronunciation drills, and grammar review; but it was unclear how many students and tutors were involved or how much time was allocated for tutorial sessions.

A notable feature of the LESA program involves a testing and placement process to insure that students pursue a realistic program in light of their abilities and language proficiency. The program staff which performs testing and placement also provides ESL students with assistance in career planning and matching academic programs, and serves in a counseling role in helping them deal with the "normal" bureaucratic processes of large educational organizations).

38. Daytona Beach Community College (Florida)

The Learning Support Center provides three major services for inadequately prepared, culturally disadvantaged, and under-performing students in a two-year college setting. The first of these consists of non-credit, individualized learning activities, at the core of which lies something called the "Individualized Manpower Training System," a highly structured diagnostic/prescriptive basic skills programmed instruction package that covers mathematics (through Trigonometry), English, reading, and human relations skills. Other allied opportunities include tutorials for any college course and study modules to help students prepare for the required statewide academic progression examination (CLAST).

A second set of services is described as "enrichment," and includes short-term workshops and study groups on such critical features of efficient academic work as test-taking skills and time management, academic games and discussion groups, and the sponsorship of visits to

Universities for students planning on transferring into a four-year degree program. The third service, counseling, covers not only guidance in developing life goals and educational plans, but also assistance to students in negotiating bureaucratic barriers.

The Center has been in operation since 1977. While it was unclear from the profile we examined how students get to the Center (required on the basis of placement tests? referred by faculty? self-selected?), or how many students use what services, we know that the retention rate for students who use tutorial services is 90-95% (versus 30-50% for those who do not). We also know that the increases in grade level competence for students using the Individualized Manpower Training System range from 0.6 levels in Reading to 1.6 levels in Math (but since no baselines were offered, and since there were no control groups, it is hard to judge those measures). Evidence of success might look better if the data collection and reporting were more rigorous.

39. Ramapo College of New Jersey

After the introduction of a statewide Basic Skills testing program for entering college freshmen in 1978. the Remedial/Developmental Mathematics Program at Ramapo recognized that its existing single remedial course was inefficient. That is, the range of abilities displayed by entering freshmen in both numeration skills and Algebraic reasoning was so great that only different courses matched to ability groups could possibly prevent massive failure, discouragement and attrition.

Three options are thus offered to students on the basis of test results: (1) a one semester course combining a review of computation with elementary Algebra; (2) a one semester course involving a short review of computation and a major emphasis on elementary Algebra; and (3) a one semester remedial course in computation only, after which the student moves to option #1 or 2, depending on the results of retesting. Options #1 and 2 are called "developmental," and are very intense: 200 minutes of instruction per week. All sections employ a Piagetian approach that moves from the concrete to the abstract, from illustrative models through patterns to abstract relationships.

Alternate versions of the New Jersey Basic Skills Test (which is normed for 7th grade arithmetic and 9th grade Algebra) are used to certify proficiency. A student must score 80% on the test to pass the course--the same score that would have exempted him/her in the first place. Some 90% of the students who take the "developmental" options succeed in doing so. But the program administrators point out that such data are insufficient indicators. In order to present convincing evidence, one also needs to demonstrate: (a) consistency in program results over time and (b) student retention of knowledge. In addition, one needs to employs sufficient statistical controls to determine whether changes in performance might be traced to intervening variables such as other courses students take. An evaluation including these analyses was conducted on a random sample of 600 student alumni of the program between 1981-1984, and the results were positive on all three

counts. The methodological care of this evaluation is very important to the assessment of remedial programs.

40. Mass. Inst. of Technology and Others

The Strategic Mathematics Pedagogy Consortium (including both school systems and colleges) is grounded in some knotty notions of brain theory yet directed at a very simple observation about mathematics--it is a language, a language based in our capacity for abstraction, and yet a language that students are not encouraged to speak. No wonder, the profile observes, that a "remedial industry" has sprouted and multiplied in the field of mathematics.

Part of the reason we do not "speak" mathematics is pedagogical: students are lectured at in math courses, the dominant mode of instruction is demonstration, and the dominant mode of learning is written problem-solving. Another reason is frankly philosophical: many mathematics teachers (at all levels of education) believe, for example, that one learns arithmetic in order to develop computation skills, whereas the case is precisely the reverse. Computation, this program holds, is the mode of access to mathematical language. By reflection on this issue, the program designers reached the conclusion that abstraction is the prerequisite for applications in mathematics, and not vice-versa.

If so, then students "ought to 'speak' mathematics" more often, ought to "rehearse its abstractions in fluent language." Thus the classes in this program are offered at all levels of education, but those of particular interest to us are Algebra classes in colleges. Students "recite" in these classes, are prepared to recite, and rehearse in the same way they would in studying a foreign language. The management of classroom conversation in mathematics is difficult, and instructors must be trained so that "every recitation by every student will end in a successful performance." That means that as an instructor, you cannot explain by using a level of mathematical language that the student has yet to learn. Instead, you need series of questions in a language to which the student can respond. Algebraic word problems are classic material for "decomposition" into such questions, as they force the student "to speak mathematics" in pieces that can be "rehearsed."

Precisely how such a fascinating approach to academic work in math is brought into being in a classroom was not rehearsed in the profile we reviewed. But the example of a number of sections of a "remedial" Algebra course at UMASS/Boston demonstrated that students in the "strategic sections" performed "better" than those in the control sections--though what "better" means was not indicated.

41. Springfield Technical Community College (Mass.)

The General Studies Departmental System at Springfield Technical Community College, designed for developmental education students, is a creative and sensitive approach to both the academic and financial factors in retention.

Students in need of developmental work in English and math normally find themselves in a Catch-22. They are not allowed into degree programs in academic or occupational departments that must insure continued accreditation through entrance standards. But if one is not in a degree program, one is not eligible for certain kinds of financial aid. In a community college located in an economically depressed section of a metropolitan area, that Catch-22 can swiftly result in attrition.

STCC solves the problem through a mechanism called "intra-college transfer." That is, within the College, six Cores of Study have been established for developmental education students, each Core matching one of the broad areas in which divisional curricula are arranged: Transfer/Arts & Sciences; Pre-Health; Pre-Technology; Pre-Engineering/ Science Transfer; Pre-Business or Service; and Bilingual Programs. It is then possible for the student to declare a degree intention and enroll in a course of study that is pre-requisite to the degree program.

The college serves roughly 4,000 students, of whom 750-850 in any one semester are considered "high risk" enough to place in one of the Core programs. Placement is made in two stages: at the time of application to the college (and by virtue of assessment of the student's transcript) and through a testing program on entrance. The student is assigned both a career guidance counselor and an academic advisor associated with the Core in which he/she is placed. To move from the Core to the degree program (i.e. "intra-college transfer"), the student files a formal application. If that application is rejected, the student goes back for further prerequisite skill building.

The program has been in existence since 1978, so some data are available on the results of this process. From the data provided, it appears that half the students in the program apply for intra-college transfer each year. Of these, 75% are accepted. Of those who are not accepted, half (or less than 5% of the total Program enrollment) do not return to the college. And half of those turn up at other colleges. So the attrition rate is rather low. In addition, because students enroll in specific "Cores" related to their career objectives, they perceive both a goal and the relevance of their current training toward that goal--a factor that can only increase the retention rate among those who are not able to achieve the Associate's degree within the normal two-year time frame. It should also be noted that the college has performed a longitudinal study on a sub-group of disadvantaged minority students among the developmental group. The retention rate for these particularly high-risk students was 60%; and attrition was most highly correlated (not surprisingly) with severe deficiencies in reading comprehension.

This type of program is transferrable (even to those community colleges with a large number of occupational programs requiring significant annual outlays for state-of-the-art equipment) because it involves centralizing a workforce of remedial skills instructors that is already in place. Thus, the only additional resources required are one FTE professional and part-time student assistants who can coordinate the contributions of existing academic and student service departments.

42. Stockton State College (N.J.)

Retention efforts, as we have seen, are particularly important for students transferring from community colleges to baccalaureate degree granting institutions. They are more important when those students are returning adults; and for these students, retention can mean developing a capacity for self-directed lifelong learning. Such an approach to academic work and motivation is thus not limited to the attainment of the Bachelor's degree.

Stockton State has developed an upper division program in nursing for those who have previously received the Associate's degree in the field, in response to the recommendation by the American Nurses' Association that the B.S.N. be the entry level degree for professional nurses, and in particular light of its geographical position in relation to five community colleges and four nursing diploma schools in the southern part of New Jersey.

The Nursing Program at Stockton opened in 1975, and received full accreditation from the National League of Nursing in 1980. In order to be admitted to the program, an applicant must demonstrate junior standing by either earned credits or CLEP examination (for non-nursing courses only, and only at the 50th percentile or better), including 44 credits in the traditional arts and sciences disciplines and 20 in lower division nursing courses.

But prior credits are not enough to insure success. A transfer counselor visits area community colleges and schools in order to advise potential applicants and answer their questions long before they come to Stockton. Once in the college, the process of close monitoring of progress is shared by the student and a "preceptorial advisor" (who plays a decidedly secondary role). Stockton assumes that its nursing students are highly motivated, and that they can largely serve as their own counselors. This high risk strategy seems to work, at least if one judges by the testimony of students. But the key lies in clear and detailed communication about admissions, progression, retention, and course and program objectives, reinforced by systematic student involvement in course and program assessment that emphasizes the evaluation of content and format more than instruction. The more students are thus involved as members of a learning community, the more the community supports the objectives and persistence of its learning members.

To bring the benefits of the world of learning to the world of practice--and thus to extend the clear focus of the learning community that keeps students involved--senior projects designed to teach, influence or serve community groups on health-related matters are required. The impact of such work on the Nursing students is reflected, in part, in the fact that over 60% of them go on to graduate school (v. roughly 25% for the college as a whole). If that is one step toward lifelong learning, the program seems to be achieving its underlying goal.

PART D:

COMPETING MODELS OF GENERAL/LIBERAL EDUCATION

This is hardly the occasion for a lengthy essay on General Education, that portion of the college curriculum (usually confined to the freshman and sophomore years) through which the student is expected to acquire a breadth of knowledge. Nor is it the occasion for an essay on Liberal Education, the process by which the student develops both the critical, reflective capacities that liberate the mind and the awareness of self and sensitivities to the lives of others that free the soul. Nor, still, is it the moment for sustained discussion of General/Liberal Education, i.e. the combination of the structure and the process that has been at the core of the traditional baccalaureate experience.

But it is an occasion to ask, as did the Commission in its discussions, and as did the NIE Study Group that subsequently wrote Involvement in Learning, whether and how individual colleges and universities provide alternative ways for students to achieve the objectives of General/Liberal Education.

The question acknowledges much about both the diversity of students in American postsecondary education and the potential flexibility of colleges and universities in offering--within themselves--competing frameworks to advance different groups of students toward similar ends.

We received a number of profiles and other documents that both illustrate and answer the question. What is their principal theme?

While they may be a bit sloppy in their use of terms such as "interdisciplinary" (biopsychology, for example, is an inter-discipline; whereas most of what is described in the profiles is really "multi-disciplinary"), our colleges are making a genuine effort to integrate knowledge. It is an uphill battle waged by some valorous warriors, since what stands in the way is the awesome power of departments and the overwhelming disciplinary orientation of our postsecondary institutions.

In its contemporary interpretation, "integration" seems to involve core curricula; and if we look at these documents, "core curricula" seems to mean a set of common, required learning experiences for all who choose to participate in a given program. But "common learning experience" is not always equated with a particular course or a particular disciplinary subject matter. The experience can be topical, modal (that is, devoted to a specific "mode of thought" such as inductive reasoning), or developmental (that is, working through a hierarchy of cognitive tasks). In most cases, students have to buy in to the experience; but the chances are far greater that they know what they are buying than in the distribution schemes that dominate General Education requirements in American higher education. At the same time, the intent of the core curricula is clearly to overcome the fragmentation of knowledge that occurs in distribution schemes and to invest the concept of "breadth" in

learning with a more coherent meaning than introductions to the languages of the various disciplines.

It may be worth noting in this context that most college curricula tend to call forth analytic modes of thought. What colleges generally mean by announcing such learning objectives as "developing critical thinking skills" is analysis--and analysis within the confines of specific disciplines. Indeed, most college faculty are comfortable with such objectives because their larger professional environments emphasize the discipline for itself. Synthesis, or integrative thinking, thus tends to get lost in college curricula, particularly when the disciplines are the arbiters of content.

The reader should not be surprised, then, to discover that these new variations on the theme of core curricula are conducted largely outside the traditional academic departments. To seek integration, they start with the student, not the subject matter. In so doing, they must experiment with traditional course organization and sequencing. One significant by-product of those experiments appears to be a very substantive version of team teaching in which faculty make sure that their assignments are mutually reinforcing. In order to do so, the organization of faculty work changes radically: from the isolated scholar to the group--and with that, to a true community of learners.

43. SUNY at Stony Brook

One of the more unusual creations in American higher education, the Federated Learning Communities (FLC) at Stony Brook have catalyzed a coherent set of solutions to some of our major academic pathologies and have come to serve as touchstones for analogous efforts in a variety of institutions.

FLC grew from an institutional self-study carried out by Stony Brook in 1973-75. The self study underscored three major pathologies:

- o the mismatched expectations of students and faculty;
- o the unintelligibility of a curriculum ordered and dominated by the disciplines;
- o and, most importantly, the "privatization" of the academic experience for both students and faculty.

Each of these pathologies works against the intended unfettering force of Liberal Education; and the document submitted to the Commission contains a trenchant analysis of their causes and consequences. The program establishes a clear alternative to pursuing the goals of Liberal Education and simultaneously serves the ends of faculty development. Basically, it nurtures a set of small "academic communities," each of which pursues a theme, e.g. World Hunger, from a variety of perspectives, e.g. Anthropology, Biology, Philosophy, Political Science, and Economics. The objective is intellectual--and not disciplinary--coherence. In consecutive but cumulative semesters, the faculty in this community offer existing undergraduate courses as a package which functions as an alternative route for satisfying General Education distribution requirements. The faculty becomes a "federation," sharing

notes, coordinating assignments and team teaching a core course on the theme.

Thus described, FLC seems to resemble a "cluster college," at least as those exist in a number of residential institutions. But what makes the FLC more than a cluster college program are two key persons in each learning community: the Master Learner and the Mumford Fellow. The Master Learner is a tenured faculty member who becomes a student, preferably in a field far removed from that of his/her training, enrolled in the same set of courses (writing papers, taking examinations) as all the students in a particular learning community. The demands on Master Learners are extraordinary: they role-model learning and personal development for undergraduates, provide feedback to the federated faculty on the effectiveness of their teaching, and must maintain intellectual humility and tolerance for the ambiguity of their roles. This Master Learner model is eminently transferrable to other institutions.

The Mumford Fellow is an advanced graduate student who shares the duties and experience of the Master Learner, and who hence is prepared for his/her future instructional role. This does not happen much in research universities dominated by the "privatization" of academic life.

The program has been evaluated by a variety of measures. Compared to non-FLC students in the same classes, FLC students earn higher grades, are more involved in course work, are more aware of world problems, demonstrate increased tolerance for ambiguity, contradiction and paradox, and move further on scales of intellectual and moral development. The personal and professional aspirations of participating faculty have also been measurably enhanced, an important outcome at a time of increased stagnation and lack of mobility in the academic workforce.

44. Miami University (Ohio)

When Miami University purchased the adjacent Western College in 1973, the faculty was solicited for proposals for a new academic division, from which emerged the School of Interdisciplinary Studies (a.k.a. The Western College Program).

The School of Interdisciplinary Studies is a total experience, not merely an academic program, and reinforces its distinctive features as a community of learners with a residential base (a dormitory that also includes faculty and administrative offices for the program). Purposefully small (300 students out of 15,000), the program serves students whose intellectual and demographic characteristics are typical of the University as a whole, but who are attracted on entrance to an unusual way of attaining the baccalaureate.

In contrast to a classic distribution system for General Education in the rest of the University, the School of Interdisciplinary Studies requires a 64 credit core curriculum that covers the first two years of college. That curriculum is organized thematically (e.g. Creativity and Culture, Natural Systems, Social Systems), draws heavily on original

source material, and emphasizes the development of synthetic reasoning (an oft-neglected but critical objective of undergraduate education).

In the spring semester of the sophomore year, students must propose an individualized major, including 32 semester hours of advanced coursework that, in combination with other proposed activities and a Senior Project, will enable them to fulfill the educational objectives they articulate. Interdisciplinary seminars in the program augment this major through the junior and senior years.

Cutting through the entire program is a four year developmental writing model, close advisement and guidance (particularly necessary to help students clarify their own expectations and goals), and the option of field and/or foreign study requiring considerable preparation.

Formal evidence of program impact is slight; but it does not surprise one that all-college student leaders would tend to emerge from an environment such as Western, nor that the retention rate for Western students would be considerably above that for the University as a whole, nor that nearly half the program graduates have continued their education in either the disciplines or the professions.

45. Pacific Lutheran University (Washington)

The Integrated Liberal Studies Program at Pacific Lutheran coexists with and supplements a "distributive core" (a euphemism, it seems, for a controlled General Education distribution requirement). Like similar undertakings, it is organized around a theme--in this case, "The Dynamics of Change," that helps students connect their own growth with paradigms of evolution and revolution in science, the arts, and society.

Basically, this is an alternate core curriculum that, instead of being confined to the lower division, is sequenced in three "tiers" over all four years of the baccalaureate experience. The freshman component is a two semester course in Western culture since the Renaissance. The sophomore and junior component consists of two-year sequences in:

- o Human Responsibility (ethics, genetics, developmental psychology, comparative anthropology, etc.);
- o Word and World (symbol systems in mythology, religion, art, literature, mathematics and science);
- o Limits to Growth (technology and social values, economic, geopolitics, and Christian ethics).

A junior/senior "tier" overlaps the second, and involves both a seminar and a "substantial" independent interdisciplinary research project emphasizing a theory of change--the theme of the program.

While there is considerable attrition among students initially electing this alternate Core, other students take Integrated Studies courses either as electives or to fulfill requirements in the "rival" Core. The flexibility of that approach allows the "competition" to remain healthy.

46. University of Iowa

As evidenced in the tone and presentation of the profiles we received (not all of which are reviewed in this volume), what the University of Iowa seems to encourage are faculty entrepreneurs with highly personalized yet unreproachable versions of liberal education. While these faculty seem delightfully unburdened by the enrollment mentality (e.g. "students have never appeared in large numbers"), the programs evidently develop enough following among students and colleagues to carry them for years as semi-autonomous academic states. Should the principal mover retire, there is a clear succession.

In a large state university, such islands provide both students and faculty with a critical sense of identity; though no one seems concerned with operational objectives or with comparative measurements of student success. The phenomenon reminds one of the medieval custom of the student buying instruction directly from the faculty member instead of from a bureaucratic university.

The Program in Literature, Science and the Arts is just such an informal alternative--and in terms of both organization and curriculum. Its processes are governed by traditions, not rules, e.g. the courses are "great books" discussions, taught by two professors (often, one experienced in the program teamed with a novice), and dominated by the Socratic method. They carry titles such as "Myth and Reason," "Form and Milieu in the Arts," and "Science and the Nature of Man." But as the profile we received wisely but sadly observed, since "the rewards for the teaching faculty are probably more personal than professional," very few untenured faculty participate.

47. College of the Holy Cross (Mass.)

In the face of a lack of intellectual coherence in the curriculum and the tendency of academic departments to emphasize highly specialized courses for majors, the Interdisciplinary Studies Program (ISP) at Holy Cross sets out to develop students' analytic and synthetic thinking skills, to expand their awareness of the complexity of human values, and to provide an alternative and rewarding teaching experience for faculty.

ISP relies on sequences (combinations of two or more courses taken in the same time period) designed to integrate with and reinforce each other. The program currently offers 18 such sequences, e.g.

- o Economics, Values and the Human Condition (history, economics, religious studies, and biology);
- o Interpreting and Making the World (physics and philosophy);
- o Gender Differentiation (genetics, psychology, sociology, history, and literature).

Faculty attend each other's classes, both to insure integration of material and to discuss disciplinary biases and perspectives. Nearly all of the college's departments are involved in these offerings, and participation by department chairs and tenured faculty is high.

Unlike many similar programs, this one has undergone a textbook-case evaluation. ISP and non-ISP students were compared using the Test of Thematic Analysis (which measures the ability to compare, contrast, and reorganize materials in order to draw conclusions) and the Analysis of Argument Test (which measures intellectual flexibility). While the statistical evidence was not overwhelming, there was a clear indication that ISP students demonstrated greater pre/post gains than students in the control group. The external evaluator who conducted this assessment concluded that the data suggest "that the actual experience of having to integrate two or more disciplines at the same time, guided by a faculty committed to and encouraging such integration, brings about greater cognitive growth than does studying the same material in separate courses without the consciously designed integrative rubric."

The program is voluntary, but a number of departments accept sequences as satisfying requirements for the major. In light of the external evaluator's judgment, the program would probably function even more effectively if courses in the major were also paired to integrate material, and the Holy Cross faculty is considering proposals to do just that.

48. University of Utah

This is not a case of competing models within the same institution, rather that of an evolving program that draws upon faculty from every college in the University to achieve its dual mission:

> (1) To promote synthetic reflection on social and economic justice, respect for individual rights and differences, dedication to the common welfare, and humane action to alleviate suffering;
>
> (2) To provide undergraduates a comprehensive intellectual framework on which to build disciplinary expertise.

In these two roles, the Utah Liberal Education program places a heavy emphasis on civic education (broadly conceived) and on the growth of generic capacities of mind.

The program has been solidly institutionalized since 1975: there is a Liberal Education Council, a deanship, and a budget drawn from college and departmental funds to purchase faculty released time (a very clever administrative strategy as it rewards those colleges and departments that cooperate). The program screens both faculty and core course proposals, and invests heavily in faculty development activities.

But how does it all work? There is a standard set of distribution requirements (six courses spread across four major fields) which are augmented by three 5-credit courses organized around problems approached from a multidisciplinary perspective. These courses bear titles such as "Creative Arts and Western Thought," "Patterns of Problem Solving," and "The Use and Abuse of Social Science." Some 65% of Utah students take more than the minimum required, a tribute to the quality and/or attractiveness of what lies behind those titles.

As the profile submitted to the Commission puts it, "the importance of course content and instructor vitality" are "co-equal," and to that end, the Liberal Education Council:

> (1) has provided course-development grants to faculty on a competitive basis;
> (2) has developed a special rank of "University Professor" to be awarded annually to an "exemplary undergraduate teacher," and carrying with it two full terms of released time to work on undergraduate curriculum reform;
> (3) has implemented an annual Visiting Professorship to bring a reknowned scholar to teach one semester in the Liberal Studies program; and
> (4) publishes a quarterly newsletter on Liberal Education, sponsors an annual faculty retreat and conducts a series of faculty colloquia.

Most importantly, the Dean of Liberal Education writes comprehensive letters of recommendation in the tenure and promotion process, thus reducing the peril of pedagogical risk-taking for junior faculty.

These are no mean steps. They are wise; they are critical; they announce that the University takes Liberal Education and undergraduate teaching very seriously; they seem to flow naturally; and they are worth investigation by other universities contemplating a revitalization of both Liberal Education and the teaching function.

49. St. Joseph's College (Indiana)

St. Joseph's is a small (1,000 students), rural, Catholic, Liberal Arts college that has taken a 45 credit core curriculum and spread it over all eight semesters of a student's baccalaureate career. There is no issue of alternative models here; rather, the St. Joseph's model is "in competition" with typical practice at other institutions in that its thoroughly integrative model stands in stark contrast to distribution schemes. For students of average ability who enter with "a vocational understanding of college education," the core is more than an antidote.

The successive segments of the St. Joseph Core Program evidence a progression from self to Western Civilization to global and cosmic perspectives. In the process, the student moves from analysis to synthesis (covering history, science, and cross-cultural studies) under the guiding motto of the program, primum vivere, diende philosophare ("let theory grow from experience"). At the same time, the program includes a student skills-development component that seeks to preclude linguistic "recidivism," i.e. the tendency of students to revert to previous patterns of speech and writing after passing freshman English. Some 60% of the faculty teach in the program and another 27% give occasional lectures in Core courses in areas of their expertise. In light of the program's challenge to faculty to be both experts and learners, a participation rate of that magnitude is impressive.

Assessments of the program since its inception in 1969 confirm the college's belief that general education is more than a series of

introductions to everything; that it can be developed on models other than specialized graduate education; and that a community of seekers after truth can be supported in an environment frankly committed to values and the integration of learning. (ER)

50. Mount Ida College (Mass.)

The Bachelor of Liberal Studies Program at Mount Ida is directed specifically at transfer students from community colleges. The program recognizes the discouraging inequities of arbitrary transfer guidelines that often force these students back into the freshman or sophomore year. The undue financial and academic burden that results can only increase the attrition rate.

So Mount Ida accepts the community college degree (or its equivalent), whether the curriculum pursued was vocational or general; but it requires the transfer student to meet the basic 39 credit Mount Ida Liberal Arts core program requirements by the end of the junior year (some of the community college credits can be applied toward those requirements). It also requires the student to take a minimum of 22% of his/her total credits in a "career minor," and in such a way as to harmonize with the Liberal Studies program.

The senior year carries the major burden of this task of harmonizing career interests and interdisciplinary Liberal Studies, thus inverting the traditional sequence in General Education. There are two components of that senior year program: (1) seven "core" seminars described as "meta-disciplinary" (i.e. "going beyond the immediate frame of reference"), but in the broad disciplinary groupings of humanities (literature and philosophy), social sciences (emphasizing social thought), sciences (a philosophy of science/science and society approach) and art, and (2) a senior project carried out under a mentorship, allowing students to achieve some degree of specialization. The projects typically involve the identification of a career-oriented problem and its analysis in the context of liberal learning.

For purposes of careful monitoring in its early years, the program has been limited to 30 students. As the program is comparatively new, evaluation data do not yet exist; but the college has the opportunity to develop some convincing measures of student achievement.

51. Sacramento City College (Calif.)

Project HELP is a two-semester liberal arts package for community college students who simultaneously evidence the need for remedial work. Started in 1978, the project uses the Stanford Test of Academic Skills to identify eligible students, and thus has an instant baseline for measuring its impact.

We include the program under this category (as opposed to "Retention and Academic Work") because it offers students two options (a total of 24 credits) for fulfilling the Liberal Education requirements of the

A.A. degree. The options consist of course packages taught by the same group of instructors:

Option 1: Psychology of Personal Development, Speech, Developmental Reading, Arithmetic, Technical Work in Today's Society

Option 2: Marriage and the Family, Practical Communication, Developmental Reading, Human Development

By involving the same group of instructors in these packages, the college can utilize them as teachers, counselors and tutors simultaneously. Since the program serves many non-traditional students (those who had been turned off by the system, older re-entry women, language minorities, etc.) it perforce involves a great deal of personal counseling and extensive tutoring. A key premise of the program is that the development of a positive self image and positive attitudes about college precedes cognitive development; and the profile describes at some length the various ways in which each instructional team seeks to build those prerequisites to learning.

Project HELP employs many measures of student progress and program impact (both standardized tests and assessments and continuous classroom devices). Option 1 seems to have greater positive impact on students' communication skills; but the subsequent retention rate is very high for students completing either option. In addition, a comparative analysis revealed that HELP students attempt and complete more units at higher grades than their peers who chose not to enroll in the program.

52. Lynchburg College (Virginia)

A number of colleges and universities revised and strengthened their lower division General/Liberal Education curricula in the late 1970s. However noble and successful these efforts in improving students' skills of intellectual inquiry irrespective of disciplinary orientation, most did not extend beyond the sophomore year. Thus students found themselves jumping from interdisciplinary core curricula to highly specialized majors with no sense of the way in which these two components of their curriculum were related.

Recognizing the incoherence of that experience, the faculty at Lynchburg College developed the Senior Symposium (also open to juniors) as an integral part of General Education requirements. The Symposium assumes that by the upperclass years, the cognitive development of undergraduates has reached the stage of "synoptic comprehension," that is, the ability to place knowledge and experience in broad contexts and to exercise "responsible evaluation" of controversial dilemmas in social policy, morality, art and religion.

It should come as no surprise, then, that the content of the Symposium is organized around grand, generalized themes ("The Nature of Man," "Freedom and Tyranny," "Science, Technology and Society," etc.), the Fortune 500 of the philosophic and literary world, and the great books.

Each theme is addressed for three or four sessions of the course, and each session is run by a different member of the faculty or a visiting lecturer (in fact, there are more of the latter than the former). The burden of shaping knowledge is thus fully--and appropriately--on the students, who are expected to demonstrate "synoptic comprehension" not only on the basis of the course, but also with reference to "their total experience." A significant amount of writing is required: weekly paragraph responses to questions, monthly themes, and a final take-home examination paper. Unfortunately, the information we received contained no assessment of impact.

53. Northeastern University

The Competency-Based History of Western Civilization course at Northeastern is a carefully crafted piece of instructional design that illustrates an alternative way of presenting the traditional material of a Liberal Education program. The faculty began as too few faculties begin: by stating their objectives clearly and distinctly, and by trying to understand the most direct and efficient way of actualizing those objectives in instruction. They determined that the role of a Western Civilization course in student learning would be two-fold:

> 1) to serve as a framework within which students could come to understand their major fields and "against which to judge their own values and roles in society";
>
> 2) to develop analytical and critical capacities of mind by "extracting meaningful information from the welter of historical data," and by being consistently challenged "to make rational judgments supported by valid evidence."

More specifically, the faculty identified four "intermediate skills" necessary to the achievement of those broader ends, e.g. using other disciplines--literature, climatology--in interpreting historical data. Instructional packets have been designed for each of these skills. Each packet defines the skill, and provides both reading and questions designed to help the student through the reading and toward mastery of the skill.

Bloom's taxonomy was superimposed on the traditional temporal and spatial divisions covered in Western Civilization courses. For each topic, e.g. the Industrial Revolution, students are first required to acquire information, then apply it to other areas, and finally synthesize and evaluate it. A system of videotaped lectures keyed to an outline and textbook accompany this approach, enable the student to retrieve information, and allow the faculty more time to devote to the small group "colloquia" that are at the organizational heart of the course. Graduate assistants tutor and assess student mastery of the informational phase of presentation.

The program has been in operation since 1974. Surprisingly, there has been no systematic evaluation; though administrative and student response has been justly positive.

PART E:

THE RECONCILIATION OF LIBERAL ARTS AND CAREER EDUCATION

The interests of the Commission in the conflict between vocationalism and the Liberal Arts at the postsecondary level were first stirred by a panel discussion it held in Philadelphia on April 30, 1982 on the subject of "Performance Expectations in American Education." On that occasion, representatives of major employers in the private and public sectors eloquently discussed with the Commissioners the need for a greater emphasis in undergraduate education on programs and strategies designed to develop generic capacities, not technical skills. Specifically, the employers who testified before the Commission in Philadelphia and on subsequent occasions described their expectations for college graduates in terms of:

(1) Generic mental capacities such as:
- o the ability to look for, identify and undertake an analysis of change, regardless of field;
- o an understanding of the nature of evidence and what constitutes adequate evidence in the several broad areas of knowledge;
- o holistic and creative thinking abilities;
- o differential perspective, i.e., the ability to set existing knowledge and analysis in new contexts.

(2) Generic traits or attitudes such as:
- o adaptability and tolerance for ambiguity and complexity;
- o the ability to learn and work in groups;
- o persistence in coming to closure on an idea or issue; and
- o enthusiasm for work.

Those expectations, the Commission was advised, can be fulfilled in many ways in the undergraduate curriculum, but are most likely to be fulfilled by a strong Liberal Arts component. And yet, as former Secretary Bell observed in his address to the 1983 Convention of the American Council on Education, colleges have become excessively vocational in their course and program offerings and that some are in danger of becoming little more than "glorified work preparation institutes." In an unhappy paradox of American education, the very fields that the Commission eventually recommended to be strengthened at the secondary school level are the fields that are being eroded at the postsecondary level. The evidence presented subsequently in Involvement in Learning is rather convincing in this regard.

The tension between the utilitarian and the normative is an old one in American education. But today we wonder whether the source of the drift away from the core purposes of higher education lies primarily in the supply-side actions of colleges and community colleges in developing and marketing programs, or in the demands of students and their families for career preparation, or in the expectations of employers? That is a big and tough question that our collection of documents addresses but indirectly. That is, we assumed a situation of demand-push for career/vocational/pre-professional programs against traditional

institutional missions emphasizing the development of the mind and soul in a far broader sense through the Liberal Arts. Since there continues to be a great deal of rhetoric out there about this phenomenon, it may be worth examining what our colleges were doing about it, i.e. how they defined and went about the business of reconciling the goals of career and Liberal Arts education through specific programs.

One unfortunate reflex in the rhetoric is to equate "careerism" at the postsecondary level with programs in which the baccalaureate is simultaneously the first professional degree. We thus ignore the considerable evidence that the traditional Liberal Arts disciplines themselves have become increasingly specialized and pre-professional in orientation. Nonetheless, the pre-professional/professional reading was the most common interpretation among those who responded with profiles in this category.

Judging from the limited number of profiles here, along with readings in the broader literature, there seem to be four ways in which our colleges and universities approach the "reconciliation":

The Liberal Arts Add-On

The first assumes that, if left to their own devices, college students would elect the Liberal Arts; and only choose career-oriented programs under the external motivation of a greater promise of first employment. Given that situation, this approach implies, all one has to do is to require or otherwise entice students in pre-professional or professional programs to take more Liberal Arts courses and--abracadabra--they will develop those theoretical perspectives and appreciations of the social and ethical dimensions of professional activity that we all desire. What surprised us in this context was that we received no profiles of the considerable number of existing programs that combine undergraduate business administration with foreign languages and/or international studies.

Professional Education as Liberal Arts

The second assumes that the majority of students have no use whatsoever for the Liberal Arts and will transfer or choose other colleges rather than wade through what they perceive to be an uninspiring trench. Since colleges do not particularly care to lose enrollments, some have redefined the Liberal Arts so as to include some aspects of pre-professional education. Again, the focus is on the course; and a prime example might be including "Introduction to Management" in the Liberal Arts "core."

The Liberal Arts as Method

The third approach does not assume anything about student proclivities, but much about the difference between education and training. The former challenges and expands--hence, frees--the mind; the latter does not. The activity that accomplishes the desired end is teaching method, not course or subject. Thus,

Liberal Arts and professional program courses are not considered mutually exclusive sets. Faculty development becomes the strategy by which engineering, e.g. becomes a Liberal Art, though that does not mean clumsy courses in "Poetry for Business Administrators."

The Career Add-On: the Liberal Arts Co-op and Others

This is an honored tradition in American higher education. It assumes that a controlled work experience with academic objectives is an essential part of liberal education, that knowledge without practice is blind even while practice without knowledge is empty, and that the student who moves back and forth between the two develops a critical differential perspective. The preferred model of execution is cooperative education for students majoring in one of the traditional liberal arts disciplines (hence distinguishing itself from the internship or practicum of baccalaureate professional education), and involving alternating periods of work and study. The reader of these pages will note, however, that there are other promising approaches to the career ad-on.

What all four approaches try to address, though, are the indisputable features of professions such as engineering, law, medicine, teaching, architecture, nursing, accounting, pharmacy, journalism, and business administration. All of them:

- o Possess a history, and emerged and evolved as a result of larger forces and technological developments;
- o Evidence distinct cultures, norms, and socialization processes;
- o Manifest a distinct organization of work and different environmental conditions;
- o Are regulated both by themselves and by the public (through licensure, certification, etc.); and are surrounded by adversarial relationships in a litigious society;
- o Involve client relationships, hence activities subject to ethical judgment, and activities requiring more than passing psychological and social awareness.

While there is a great deal more one can say about the professions, the point here is that the successful practitioner is required to have learned and internalized the range of knowledges and capacities necessary to address those characteristics. How we get students from here to there is what many of the following programs try to accomplish.

54. Smith College (Mass.)

The Dual Degree program in Liberal Arts and Engineering offered by Smith College and the University of Massachusetts presents a variation on a pattern of degree organization that was more in vogue a quarter century ago than now. The traditional yoking required three years of a liberal arts program, followed by two years of an engineering program. Smith and UMass present, instead, the option of either a 5-year curriculum leading to the Smith A.B. and the UMass B.S. in Engineering or a 5-6

year course of study leading to the Smith A.B. and the UMass M.S. in Engineering. The first option was offered in 1976; the second inaugurated in 1978. Both offer the opportunity to study liberal arts and engineering simultaneously instead of successively.

There is a philosophical commitment here that overcomes the logistics of moving students back and forth between campuses some 10 miles apart (even though both schools are quite accustomed to such arrangements). In the words of the program director, it is that "the potential benefits from improved knowledge and technology can be realized more fully when the engineers who develop and apply such advances bring to their task an awareness of the human values and societal concerns by which technology must be governed." Given such a statement, the program posits a set of implicit objectives that are nigh impossible to measure, but the resulting program organization thus starts students with a heavy dose of science and math in the freshman year, followed by a balance of Engineering and Liberal Arts courses for the next three years, and capped by a fifth year dominated by Engineering. Along the way, Smith College students complete a regular major, usually in Chemistry, Economics, Geology, Physics or Math.

In addition to courses, students are encouraged to spend at least one summer working on a paid research internship, with the research project often extended through the senior year as honors work.

Student success following graduation has been marked: graduates are actively recruited by industry; and are also able to complete graduate degrees ahead of schedule.

By virtue of their experience with this program, the two institutions have also instituted an annual workshop for secondary school personnel to enhance their awareness of employment opportunities for women in engineering and technical fields and to encourage high school women's study of math and science.

55. Arkansas College

The Historic Preservation curriculum at Arkansas College is comparatively new (1982), but worth remarking on, and not merely because it demonstrates the responsiveness of a field to both community needs and student interests. In an age in which the assembling and analysis of archives has become extraordinarily important in business and government and in which concern for the environment has extended to the identification and preservation of the man-made, it is ironic that the study of history has declined dramatically.

In an eloquent, sensitive and moving justification for the revitalization of history in our colleges, Arkansas College calls for a balance between popular and academic history:

> "Popular history, left to its own devices, creates an imaginary past; academic history, denying the human need for a living tradition, digs its own grave in arid soil. This artificial separation has created a situation in which large numbers of people

> in small communities throughout the nation deplore deeply the crumbling away of buildings, crafts, landscapes, and other physical remains of their heritage but lack the leadership and historical expertise to generate plans for protection of historic resources. This large group has generally been ignored by academic historians who now face a genuine crisis in enrollment in traditional history courses from which vitality seems to have fled."

The 60 credit track in Historic Preservation was developed with the guidance of a list of job skills and understandings sought in employees by an Advisory Board of representatives of museums, state departments, and arts centers. It involves both standard courses in U.S., European, and Art history, and such specialized courses as Methods in Regional History, American Decorative Styles, Folklife, Archive Administration, and an off-campus internship/practicum in historic preservation. Teaching methods are matched with the learners, who are nearly all first-generation college students, largely from poor rural environments, and who seem to learn best in active modes engaged with concrete materials.

At the same time, a continuing education course in the field was offered to area residents. The continuing education course not only served as a lever for program development but also established strong community ties for future students and their work in the field. In the process, it also stimulated the development of a Mid-South Humanities Project involving school teachers in program workshops. Such developments must serve as positive interim indicators of program impact.

56. SUNY at Binghamton (New York)

Perhaps the reconciliation of career and Liberal Arts education can best be encouraged and executed at the graduate level. If the current pattern of expectations in American education can be altered so that undergraduates pursue Liberal Arts interests at the college level and reserve the acquisition of job qualifying skills, knowledge and credentials for the graduate and first professional levels, then we may be able to revitalize a tried and productive model. The Master of Business Administration with a specialization in arts administration at SUNY/Binghamton illustrates one way of proceeding.

The MBA/Arts program was inaugurated in 1974 after planning efforts that included task force participation by state and national arts organizations. Program faculty are drawn from both the School of Management and the School of Arts and Science, and include adjuncts with expertise unique to the needs of the program. Students are selected on the basis of strong aptitude in management skills, devotion to the arts and an interest or proficiency in at least one discipline of the arts (presumably acquired in college). The University admits 15-20 students annually in this program; and many of those students have prior experience in middle-level management.

The program of study emphasizes the development of those skills normally associated with nonprofit institutions, as well as the broad management concepts and technical skills that come with the core MBA curriculum.

Students' work culminates in a semester-long internship in an arts organization. There have been some 80 graduates of the program to date, most of whom have gone on to leadership roles in the development and stability of arts organizations. (ER)

57. The University of South Florida

Another graduate program worth recounting in this context is the decade old M.A. in Applied Anthropology at the University of South Florida. Through specialized tracks in applied urban anthropology, applied medical anthropology and public archaeology, students are first trained in, then extend, the conceptual, empirical and methodological tools of anthropology to the resolution of problems in such areas as human rights, hypertension, or community redevelopment.

The internship is perceived as the commencement of professional practice. The student proposes a field project which is carried out on a co-op model within a human service agency (and with both faculty and agency supervision). As the profile notes:

> "Realistic exposure to agency life permits the student to use the anthropological perspective, to see the problems of modern agencies and organizations in their widest relevant context and to see them the way the natives see them."

While it was difficult to determine the procedure, an elaborate assessment has evidently accompanied the internship as a way of evaluating the program. The basic method of the assessment, one infers, is a weighting of the importance of generic academic competencies for subsequent employment--something one can best judge after one has been employed. Both students and agency supervisors ranked the competencies and agreed on the essential nature of "holistic point of view," "comparative perspective," and "appreciation for a pluralistic society"--though what these mean in an operational sense was not indicated. What is significant, though, is that students judged baccalaureate level coursework to be most important in acquiring these competencies.

On both the baccalaureate and masters' level, too, students and agency supervisors ranked communication skills as the most critical set of competencies for success on the job. These included report and narrative writing, editing, conducting meetings and making oral presentations.

58. Northeastern University (Mass.)

Both humanities and professional school faculty at Northeastern have long been concerned with the narrow career orientation of their students, most of whom major in engineering, business, the health sciences and criminal justice, and almost all of whom participate in the University's seminal cooperative education program, alternating semesters of study and work. The culture of the University is a culture of careers. While that provides external motivation, it often prevents students from internalizing the reward system necessary to develop the

skills and knowledge of the generalist that are more necessary after the entry-level job.

The Humanities and the Professions Program was developed to respond to this situation. It started with four courses in the history department (Technological Transformations of Society, Historical Perspectives on Illness and Health, History of Criminal Justice in America, and History of the Professions) and a few in Philosophy and Religion on the ethical dimensions of medicine.

On the basis of these experiences, and with the assistance of the National Endowment for the Humanities, Northeastern developed 21 courses with the involvement of appropriate professional school faculty. Though courses are largely team taught, they are offered through the departments themselves, not a separate center. The Colleges of Pharmacy, Business Administration and Criminal Justice have now each hired at least one humanist, and the social science departments have increased offerings in policy areas relevant to the professional schools. Communication between traditionally isolated colleges has been enhanced, and faculty research has developed out of themes presented in these new courses.

Enrollments in the new courses understably vary, with some (e.g. "Man and Nature in America") more fragile than others (e.g. "History of Flight and Space"); but the revitalization of the humanities implicit in the strategy has had multiplier effects. While the program has been subject to student, faculty and external evaluation (all responses favorable), there are no measures of changes in student learning or attitudes. (ER)

59. St. Mary College (Kansas)

If one is to judge from the materials we reviewed, the B.S. in Nursing program for R.N.s at St. Mary College possesses theoretical foundations, objectives and processes that are far more "humane" than those of many a humanities department. As such, it exemplifies one approach to professional education as liberal arts.

The major goal of the program is to prepare the baccalaureate level nurse as a generalist who can utilize the critical thinking process to deal with complexities and uncertainties that exist in health care situations. "Critical thinking" is not used as a slogan here: it is explicitly defined as a series of measurable cognitive operations involving assessment, definition, approach, implementation, evaluation and revision.

The population served by this program is a familiar one to Schools of Nursing in recent years: practicing RNs who never finished a baccalaureate degree (but who must hold 55 college credits with a 2.0 GPA or better in order to be admitted), i.e. older, part-time, returning women who are simultaneously practicing professionals. This bureaucratic recitation, though, is far less important than the way the the subject and the profession are perceived:

> On the subject: "Health is. . .a dynamic state. . .It is defined as the adaptation of the individual that promotes optimal functioning. The definition of health varies over historical time, within cultures and between individuals. . ."
>
> On the profession: "Nursing functions to support the responsibility of the individual to attain and maintain health and aids the individual to achieve restoration of health. . . .Professional nursing is a practice-oriented discipline based on emerging nursing theories as well as on the biological, physical and social sciences, humanities and other liberal studies. . . ."

As to what is done to actualize all of these objectives, the details are rather thin. Nonetheless, we can make some inferences. We know that the timing and location of offerings are responsive to the needs of part-time adult working professionals, and that many of the required liberal arts courses, as well as critical upper-division courses such as Statistics and Pharmacology, are offered at a variety of off-campus sites. Activities in the in-service portion of the curriculum involve time management, values clarification, and assertiveness training for dealing with special health populations, e.g. alcoholic patients, the preparation of pamphlets on breast feeding, the study of play behaviors of hospitalized children, and procedures for monitoring ICU patients, among others.

What all of this does is difficult to determine by positivistic measures; and, in fact, the program has none, though it strikes us that St. Mary has a great opportunity for more systematic assessment.

60. Queen's College (North Carolina)

The Women's Leadership Program at Queen's College is a noteworthy variation on the "career add-on" approach. Instead of a co-op model and instead of using career counseling as a student service, the college utilizes a sequenced curriculum to provide its all-female student body with clear and purposeful goal-setting and problem-solving skills, as well as the personal and formal leadership skills that are required in American business and industry. Developed with assistance from the American Management Association, the curriculum includes requirements for freshmen and sophomores and elective opportunities for juniors and seniors.

Leadership I, required of all freshmen, is a total immersion course offered in a three-week intensive January term, and is taught by visiting personnel from the American Management Association (a creative approach to staffing). The course uses a variety of experiential techniques in leadership, organizational dynamics, personal development, and, most importantly, communications (including platform speaking). Sophomores may meet the requirement of Leadership II by participating in either Outward Bound, a study tour, a leadership internship (under a female executive) or a career exploration course (which includes practice in resume writing and interviewing).

Further work in the Leadership Program is elective in the junior and senior years through an AMA course that involves students with executives and management experts in discussions, simulations, small group decision-making, and management games.

While the program is in its sixth year, and has involved every student in the College of Arts and Sciences, the results cannot be fully assessed. The existing evaluation is based on self-reported "perceived degree of behavior change" from a limited sample of students who have indicated significant improvement in oral communications skills and moderate improvement in writing skills and the development of values. Given the objectives of the program, there must be better measures. The College is now using a trace of alumni career development as an indirect measure of program impact.

61. University of Cincinnati

Many liberal arts students suffer intense anxiety about their employment prospects. In addition, many seek to finance their college education by combining full-time study with menial part-time work. The pressures that result decrease their ability to benefit fully from their courses, and the work experience too frequently offers little to prepare the students for later employment.

The five year Cooperative Education program in the College of Arts and Sciences at Cincinnati seeks to combine the opportunities for both liberal and career-oriented education and to assist low income students with an alternative to working and studying at the same time. While Co-op programs have existed at Cincinnati for nearly 80 years, the Arts and Sciences program was initiated only in 1976. It is currently available to majors in Communications Arts, Economics, English, French, German, and Spanish. To be admitted to the program, students must maintain a 2.5 average in their freshman and sophomore years, and be willing to accept placement during their "co-op quarters" out of state, or (in the case of foreign language majors) abroad. The only common experience is a course in Professional Development intended to acquaint students with career planning and choice, knowledge of professional communities, and work-world skills. On the other hand, an international orientation to the student's work in business administration is wisely and strongly advised.

The credentialling aspects of this program are particularly interesting. In addition to the A.B., the student receives a "Certificate in Professional Practice," and may choose to earn credits required for other "Certificates" as well: in Business Administration, Writing, etc., but it was difficult to determine the criteria for such certificates, or what, precisely, they mean.

To establish a strong future for a program such as this requires extensive outreach; and the program coordinator has build up a large network in area high schools, particularly among guidance counselors and foreign language teachers. Through this type of network, high school students can begin to think about the relationship of the liberal arts to careers early enough to guarantee constructive choices. (ER)

62. Stanford University (Calif.)

The Program in Human Biology at Stanford reminds us of a misusage in our discourse concerning the reconciliation of liberal arts and the career interests of students. That is, by "liberal arts," we should mean the traditional arts and sciences. We too often assume that to study science in college automatically leads to a secure career, or, at the least, leads directly to a professional school education (e.g. in medicine) that secures a career. But the labor market for those who major in the basic sciences has not been as consistent as our casual assumptions, and, in any event, we know that the intellectual training of undergraduate science majors is applicable in a variety of non-scientific occupations. An increasing number of public policy and management fields, in particular, require not only solid training in the sciences, but also substantial knowledge of non-scientific fields. The Program in Human Biology was developed, in fact, with an eye toward the practical environments of policy making in which such problems as population and hunger, pollution, conservation of natural resources and the costs and delivery of health care are addressed.

Students enter the program in their sophomore year, and the subsequent curriculum, however individually designed, can consume as much as two-thirds of their total college credits. With a proportion of that magnitude, one might be concerned about over-specialization; but the nature of the curriculum mitigates that concern. In addition to six semesters of core courses that integrate the biological and social/behavioral sciences, a minimum of three semesters of special Human Biology courses, and one course in statistics, students also take either health or environmental public policy, and a supervised practicum (that simultaneously serves an outreach function to area community service agencies). In consultation with both student and faculty advisors, majors also design an "area of concentration" that involves at least five semester courses. An additional "honors option" is available, and requires both a thesis and oral presentation.

Faculty for the program are drawn from the Medical School in addition to the traditional departments of the University, thus encouraging a link that often does not exist in complex, research universities. The "learning community" nature of the program is reinforced by student roles as advisors, teaching assistants, and special activity leaders.

The program has been in existence since 1971, and graduates approximately 150 students per year. Given program objectives and the elite nature of the student body, the Office of Advisement and Career Planning has used a simple survey of student status immediately following graduation (not exactly the optimum time for such a survey) as a measure of impact. In recent years, about 30% of the students have gone directly into professional school in health-related areas (medicine, dentistry, public health, nursing, occupational and physical therapy, special education, hospital administration, etc.), with another 20% taking jobs in health-related fields, and a slightly smaller percentage in management/sales/finance/public relations areas. How this distribution compares with that of the rest of Stanford graduates was not indicated.

PART F:

SCIENTIFIC AND TECHNOLOGICAL LITERACY FOR THE NON-SCIENCE MAJOR

The track structure of postsecondary science education has never been disputed. Depending on the size and complexity of the institution, there are 3-5 science tracks in baccalaureate degree-granting colleges:

1) A "track" for majors in non-scientific fields, e.g. humanities, social sciences, business, education (though in the last of these cases, certification requirements for future science teachers may take the student beyond the standard pattern). The term, "track," is probably inaccurate, since students in these fields tend to take introductory science courses for the sake of fulfilling General Education requirements, and do so largely within a distribution scheme.
2) A "track" for pre-medical/dental/veterinary students. Again, "special core" would be a more accurate label than "track" for the collection of courses these students take.
3) A "track" for science majors, which generally requires the student to take coordinate courses in allied science departments and in mathematics.
4) Tracks for pre-professional degree candidates in health professions fields such as nursing. Oftimes, special sections of standard courses, e.g. Biochemistry, are offered to these students.
5) Tracks or "co-requisites" for students in pre-professional programs in fields such as engineering and architecture.

Our principal interest was in the first of these "tracks," on which a majority of undergraduates travel (though some of the programs below apply to students on the other "tracks" as well). Prevailing folk wisdom says that these students are usually fed watered down versions of basic science courses, versions that do little to advance on standard secondary school courses in Biology, Chemistry, and Physics. The scattered evidence also suggests that these students take no more college science than is required, and few courses that broaden their ability to make informed decisions as citizens concerning issues requiring scientific knowledge.

When one asks colleges and universities about special efforts vis-a-vis scientific and technological literacy for non-science and engineering students, most of the responses fall in two categories: "Computer Literacy" and Science, Technology and Society (STS) programs. Whether we've outgrown the "Physics for Poets" courses that once flourished is impossible to tell from the materials we examined. But as one observer of that issue noted, "all students who take college physics--science and non-science majors alike--ought to reach the stage of reflection on the metaphorical nature of the subject matter, and understand why metaphor is necessary to discovery in physics."

Indeed, a number of programs reviewed here address science for the non-scientist in terms of the abstract thought and modelling that distinguishes "higher" from "lower" order science. In other words,

science is here used for purposes of cognitive development, and for challenging the low theoretical orientation of typical entering freshmen that has been thoroughly documented in the literature.

Another aspect of collegiate science education that turns up in these profiles involves the use of computer technology to alter the patterns of access to information, the tasks involved in learning college-level science, the amount of time required to obtain and manipulate scientific information, and (unintentionally, perhaps) the relationships between instructor and learner. Unfortunately, we did not hear about projects utilizing interactive videodisk technologies in those basic science courses where some demonstrations and experiments require equipment and situations that are too impractical for the laboratory or classroom. We know that such projects--along with some promising software--exist, and that they require the student to predict, project, and/or solve, thus utilizing complex reasoning capacities.

Some of the profiles we received described CAI programs employing too much of the drill/assessment software that separates the learner from the instructor and the instructor from the assessment process. The involvement of the college faculty member in such cases, we observed, is often limited to designing or adapting the software and then occasionally walking through a computer lab to make sure the machines are functioning properly. Whether the students learn in anything more than a mechanical fashion is another question. In the main, that criticism does not apply to the programs selected for this section.

63. University of Notre Dame (Indiana)

The "Computer Applications Second Major for Arts and Letters Students" was introduced in response to the concern of faculty that students were unfamiliar with the potential of computer technology for a wide range of human problem solving and in response to the concern of graduating Arts and Letters students that they had few marketable skills.

Students in this program are not trained to be computer scientists, but are prepared to serve as intermediaries between computer scientists and upper levels of management in both private and public sector enterprises. To that end, students are provided with a basic understanding of at least three widely used computer languages, with experience in applying this knowledge to actual research and organizational problems, and with an understanding of ethical issues raised by the advent of computer-related technologies.

The Computer Applications Second Major is thus designed for students with a primary major in one of the traditional Arts and Letters disciplines. Program requirements include 9 credits of programming languages, 3 of philosophy, 3 of statistical literacy and application, and 9 of project-oriented applications courses, often of a tutorial nature (and in which the student is encouraged to pursue applications that enhance the primary major).

Approximately 110 undergraduates are enrolled in the program. Surveys of the first few graduating classes indicated that all students received

more than one job offer and started at higher salaries than other Arts and Letters majors. A significant percentage of graduates also reported that the education provided by the second major was an essential component of their work. (ER)

64. Wheaton College (Mass.)

The Computer Literacy Project at Wheaton is based on the belief that computing experience must be integrated within the liberal arts education of all students rather than added to an otherwise static curriculum. More significantly, the Project recognizes that this goal cannot be met until a majority of college faculty, convinced that the computer can serve them, become enthusiastic role models. Hence this project has emphasized turning the entire faculty into computer users and enthusiasts. Faculty development opportunities have been offered each summer since 1978, and 31 faculty members from a wide range of disciplines have been supported in individual or group projects designed to involve students in computer use within courses taught by those faculty.

Additionally, 35 faculty have attended unpaid text-editing workshops, and 8 have attended an informal course in PASCAL taught by a colleague prepared within the Project. There are now 24 academic computer terminals on campus (up from 2 in 1978, when the project began).

Student computer use has increased in line with expectations from this "filtering" approach: 700 students (out of 1200) now use computing, and more than 80% of graduates have been enrolled in a course which required computer work (and by "computer work" is meant a good deal more than word-processing). Not surprisingly, the faculty has now recommended a liberal arts Computer Studies Minor much like the Notre Dame second major described above, with courses in PASCAL, Data Structures and Computer Organization at its core.

Key elements in the success of the Wheaton effort included the guidance and support of the administration, faculty participation, with incentives to "risk" computer learning, an NSF CAUSE grant that supported the hiring of professional staff, and a user-friendly computer center whose director is particularly sensitive to new computer students. (ER)

65. Wesleyan University (Conn.)

The Science and Society Program at Wesleyan is a cross-disciplinary, problem-oriented undergraduate major, designed for students interested in interactions between scientific knowledge and social issues. The program is largely self-constructed and demands a senior thesis.

SISP has been in operation since 1975. It offers a sequenced core of required colloquia covering topics in the history and philosophy of science, case studies in policy and planning as applied science, science as a social institution and current issues. Majors complete other required courses from a list of university offerings, and additional programmatic electives, selected with the aid of their advisor. The

minimum requirements also include two semesters of a natural science and one of math, though the material submitted did not indicate how far SiSP students exceed these rather standard minimums.

A distinguishing feature of the program are sets of comprehensive oral and written examinations by external examiners (also see # below) in both the junior and senior year. In the junior year, students are tested on their comprehension and integration of course work; in the senior year, the examinations focus on the student's thesis and its relationship to broader issues. These examinations also serve as a source of program evaluation, a wise use of the procedure.

Since establishment as a regular part of the Wesleyan curriculum (after a five year probationary period during which it was supported by soft money), the program has measured its success, in part, by a constant growth rate in student enrollment. While there continues to be a significant erosion during the progress of each class to its senior year, the program directors attribute that to students' need for a more structured major rather than to dissatisfaction with the program as offered. SiSP graduates perform above the norm at Wesleyan in their receipt of Honors and High Honors; and the limited follow-up information available indicates that almost all graduates are working in jobs related to their training or preparing for careers in the general area of science and society. Program faculty, who offered the Commission a candid and very engaging assessment, believe that they are demonstrating that the liberally educated person is most likely to be able to respond imaginatively and constructively to the major issues of our times. (ER)

66. Bowling Green State Univ. (Ohio)

"Approaches to Value in Technological Culture" is a course that is now ensconced in the General Education curriculum at Bowling Green State. It is offered through the Humanities Cluster College, a residence hall based program. The residential environment allows it to be delivered as a double-course, meeting 5 days per week for eleven weeks, and thus providing an opportunity for concentrated exploration of some very basic questions concerning technological society. This cluster course does not presume any scientific knowledge, though a goodly percentage of its students are principally freshmen from the professional colleges, including the School of Technology.

The course lives within its conceptual and disciplinary limits, which is to say that it deals with accessible knowledge subject to humanistic inquiry. Questions concerning the nature of technology and the ways in which it has been both affirmed and opposed in the history of culture serve as organizing frameworks. A heavy reading list, augmented by films (e.g. "Modern Times"), guest speakers (e.g. on a topic such as Technology in Modern Music), field trips and exercises (e.g. survival design) expose students to a wide range of attitudes, responses and resolutions of the enduring opposition of technological progress and the pastoral ideal. The course is team-taught and restricted to a "manageable" group of 25-50 students. Needless to say, the course is also an effective vehicle for faculty development.

Impact is assessed through the ACT/COMP examination. While it is difficult to measure the impact of one course through the COMP exam, and while there was no pre-testing, students score significantly higher on the "Using Science" section of the exam than on other sections.

67. Lehigh University (Pennsylvania)

The Science, Technology and Society program at Lehigh was established in the early 1970s within the Humanities programs and with a particular focus on technology--in fact, very much like the focus of the Bowling Green State course. But this program has since expanded to include the perspectives of the social sciences and the objects of the basic sciences as well as technology.

Like many similar undertakings, STS is an autonomous program cutting across the whole undergraduate college and presenting its students with the option of a minor in "Technology and Human Values." Beyond two interdisciplinary core courses, the academic offerings are determined by faculty convictions and interests, with the home department being credited with the SCHs generated (a key to departmental support for non-departmentally based programs).

The result is a very wide range of courses (over 50, and including such titles as the Politics of Science, Technology Assessment, Electronic Music, Science Fiction, and Medical Ethics), reflecting a healthy eclecticism and the conviction of program administrators that the diversity of subjects and approaches "is not a problem as long as they are perceived and portrayed as part of a larger picture." At the same time, though, the program has consciously chosen to emphasize historical perspectives and offers several survey courses in the histories of science, technology and medicine. A package of engineering-oriented courses for liberal arts students is being prepared in such a way as to stress the qualitative aspects of the subject matter.

With such an extent of offerings, it is not surprising that almost all Lehigh students take at least one STS course. In light of a modest program objective to provide students "with at least some greater understanding of science and technology and their social context than they might otherwise have," such a coverage may provide results--though there has been no effort to assess who learns what. On the other hand, through its Technology Studies Resource Center, the program produces, gathers and disseminates a wide range of products (e.g. exemplary course syllabi, bibliographies, audio-visual materials, curriculum newsletters, and data bases) that are useful to college faculty working in STS projects.

68. University of California at Irvine

This program comes without a title but with a potentially high-impact product: a set of computer-based learning modules to develop scientific literacy in the general public and for use principally in non-school settings (e.g. library, home). The questions addressed by the modules are both sweeping and essential to an understanding of science: how is a scientific theory developed? what are the empirical bases of science?

what is the role of prediction in science? how are scientific theories verified, modified and judged?

The software assumes no previous subject matter or computer experience; and while the modules were first used in public libraries, they have since been tested in schools, community colleges and universities. At the computer terminal, the student is required to behave like a scientist, working through real and imaginary situations in order to gather information, develop hypotheses, make predictions, verify predictions, modify hypotheses, and discover scientific laws. No instructors are required.

It is very difficult to assess the success of a program such as this because there is no instrument, at present, that thoroughly tests students' knowledge of the nature of science. But as such software becomes more widely distributed and used, someone will have to ask the tough questions and develop an adequate evaluation instrument.

69. SUNY at Cortland (New York)

The Learning Cycle Laboratory for General Chemistry was developed as much for non-science students as science students, as it recognizes that entering college freshmen--no matter what their academic and career objectives--have not attained the level of cognitive development at which one is fluent in abstractions and theory. The learning cycle approach (involving exploration, discovery and application) seems to hold promise for increasing student comprehension of the most abstract concepts in chemistry.

It is thus the laboratory that is used to address the development of formal reasoning skills instead of the more common approach of covering the theory and reasoning in the lecture sessions of a General Chemistry course and leaving students only to memorize manipulative techniques for the lab and to compile half-digested data without any notion of its relationship to theory. The program is also wise in confronting the fact that faculty who teach science labs (and in larger universities, that often means graduate students) "have had very little training in learning theory . . . and have difficulty presenting course material so that students at a concrete operational level of intellectual development can understand it." Thus, participating faculty first take a workshop on the "Development of Reasoning Skills in College Students," one following the same Piagetian approach as that used in Project SOAR (see # 15) and Project COMPAS (see #27).

The first task in restructuring the General Chemistry Lab was to delete existing exercises which consisted of "tedious calculations" for previously-determined knowns and applications of principles which had not been developed previously from concrete experience in the student's work. Thus, the slate was wiped clean for the learning cycle model in each of 20 laboratory experiments.

The experiments themselves involve some fairly standard topics in General Chemistry such as molecular weights, chemical bonding, equilibrium, and complex ions. Working in small groups, students are

asked to design lab procedures and to take detailed notes on the exploration phase of each experiment--concerning which there is extensive class discussion (a departure from the traditional organization and conduct of laboratories). As for results, we know that students and faculty have developed most positive attitudes toward the Chemistry lab, but we do not know whether students reach the desired stage of comprehending the theories involved.

70. South Oklahoma City Junior College

A calculus-based physics course in a community college sounds rare enough; and while it may produce students who go on to study science in four year institutions, the approach of this competency-based CAI project presented to the Commission is designed more "to tutor problem solving . . . than teach physics concepts."

In such a calculus-based course, over 40 separate objectives requiring the application of physical concepts and mathematical rules must be completed without error. Recycling, an integral part of a competency-based system, consists of tutoring and retesting students on missed objectives. While this method is intended to insure that students acquire necessary knowledge and skills, it leaves the instructor little time to help individual students.

The goal of the project was to develop 50 tutorial lessons for students who were experiencing difficulty with specific types of problems. Each program, requiring about 30 minutes of student time after classroom instruction, concentrates on establishing a method of problem solving, the identification of known and unknown variables, and areas in which student errors are common. Microcomputers are available in an open physics laboratory, allowing for assistance even when the instructor is not present.

The profile contains a very frank assessment of the difficulties and successes of developing software for a tutorial of this type, e.g. "while the programs still require student input and decision-making, less than desired sophistication in computer response was incorporated." The complete set of 42 programs covers classical mechanics, thermodynamics, electricity and magnetism, optics and graphing data. The actual operation of the tutorial lab requires para-professional personnel to maintain materials and assist students with the operation of the computer.

Since the tutorial programs have tests built into them, evaluation is ready-made. Pre/post comparisons demonstrated that the average number of assessments which had to be repeated by students completing the course dropped 20%-- a change attributed, in part, to the increased time-on-task required by the CAI tutorial. The drop-out rate in the course has also shrunk considerably: from over 30% to 18% in two years.

The software for tutoring classical physics so painstakingly developed here have been widely distributed at no cost, and both the college and the instructor are to be commended for their dissemination efforts.

71. The University of California at Irvine

Large introductory science courses in universities often leave students to flounder. The Mastery Learning approach of the Computer-Based Introductory Physics course at UC/Irvine seeks to individualize learning --and hence provide greater motivation and direction--while holding down costs.

The Educational Technology Center at UC/Irvine originally tried to implement the Mastery Learning approach in this course without the managerial and tutorial capabilities of the computer. But the computer is actually more cost-effect, and provides feedback to the student through on-line testing. The computer thus takes on instructional functions in addition to assessment.

Students registering for Introductory Physics are presented with a series of options. They first choose between taking the course in the conventional lecture-and-textbook mode or through a computer-based presentation. Those who select the latter then choose one of two "tracks": the first is based on the conventional course, drawing its material from the most popular of the calculus-based Introductory Physics textbooks (Halliday and Resnick); the second is grounded in a set of notes developed by Irvine faculty so that the computer can be used in a programming mode.

Whichever of the two computer-based options is selected, students first receive an outline of each of the course units, complete with indicated learning resources and sample examinations. The student then becomes a master of his/her own time, taking the exams (2 or 3 per unit) on the computer. The computer generates different examinations for each student (there are over 600 versions of each exam--and 400 students in the course), keeps track of student performance, requires a 12 hour delay between takings of the same test, and refers students to instructors for individualized assistance if they fail to pass a given exam in four attempts.

Approximately 70% of the students in the course elect the computer-based Mastery Learning "tracks." We are told that they "do well in succeeding courses," though exactly what that means--particularly in relation to students who take the course in its conventional delivery system--is an open question.

72. University of Rochester (New York)

The Integrated Chemical Information Curriculum is addressed to science majors in an elite university, but its principles warrant consideration in other collegiate settings because they embody a multi-dimensional notion of educational technology that is not frequently used in college-level instruction. That is, the program proceeds from the premise that while college students are taught scientific fundamentals, they generally do not learn how to locate scientific information hidden in books, journals or data bases. Separate library instruction at Rochester has previously failed to meet the needs of science majors, so

a strategy of integrating information resources into the undergraduate curriculum was developed.

The first phase of the curriculum involves students in the principal source materials in organic, inorganic, organometallic, physical and nuclear chemistry in the context of their regular laboratory activities, while Chemical Abstracts computer searching is taught in separate Saturday lectures. In the second phase, students are exposed to a series of advanced topics in chemical information which emphasize on-line computer retrieval of both bibliographic and non-bibliographic resources, and which are integrated with independent research.

Each phase involves information problem-solving experiences using both printed and computerized sources. Students are judged on how they prioritize potentially useful citations from sufficient numbers of sources and on their ability to distinguish optimum from representative information. The result? Scores of undergraduate chemistry majors on the Library Skills Test have been consistently higher than those for entering graduate students. Student attitudes toward the curriculum are positive, and endorse the notion that being connected to current developments in a field and being able to locate relevant references for research is central to learning in the sciences.

73. Loyola University of Chicago

Professors of physics, chemistry, and biology have long recognized that many non-science majors enter the introductory courses in these subjects with low expectations due to fear of the subject matter. Like its cousin, "math anxiety," this unfortunate phenomenon may stem from poor experiences in elementary and secondary school, sex-role and racial stereotyping, or the our prior failure to teach students the specific skills necessary for approaching scientific subjects. An example of the latter lies in the teaching of reading: our schools and workplaces emphasize speed reading, whereas the reading of scientific materials should be an intense but slow process, often involving notetaking and diagramming in the margins of texts.

The Science Anxiety Clinic was thus instituted at Loyola to identify students who fear studying science and to improve their science learning skills and help them overcome their anxieties. Since 1977, the Clinic has served 30-40 students per semester through instruction in reading scientific materials, in approaching scientific problems in a systematic fashion, in using problems to elucidate texts, and in interpreting graphs. The Clinic simulates a science course, and while students are learning skills, a psychologist helps them explore the ways in which they create their own anxiety and assists them in substituting more objective assessments of the task at hand. Relaxations reactions are also substituted for anxiety.

Pre- and post-tests of Clinic students showed significant anxiety reduction compared with a control group. In addition, students have reported changing career goals to scientific fields, or retaining science-career goals they had considered dropping before the Clinic experience.

Part G:

LANGUAGE: EXPANDING PERSONAL SPACE

The national concern with decline in the verbal skills of students at the secondary and postsecondary levels usually focuses on writing. Some claim that the act of writing in society--particularly in the workplace--is passe, so a decline in performance really does not matter. But there is no evidence whatsoever that the age of information technology has eliminated the necessity for writing--and writing well. In fact, the deficiencies of college graduates that were cited most frequently by employers testifying to the National Commission on the educational preparation of all new employees were those in communication skills. Employers know that the more technological our economy and the more we process information as a commodity, the more writing will be required in a changed workplace where academic skills are superseding manual skills. Thus, those who possess a high level of competence in communication skills will be able to participate in the information economy. Those who don't, won't.

Notice, though, that employers cited communications skills in general, and not writing in particular. There are four language skills, not one; and they are all related, though in ways we understand too imperfectly. While there are philosophical arguments and psychological evidence about the issue, many believe that reading, listening and speaking, as well as writing should be active skills, involving decoding, interpretive and encoding processes. But because writing requires a greater investment of time, reflection and energy, we tend to think of writing more as a performance than the others, hence more subject to direction.

Our uses of language form the boundaries of our personal, social, economic and cultural space. The spaces are complex; and the boundaries are elastic, so that by expanding our language, we can fill the spaces. Colleges emphasize writing in the process of expanding students' language, principally because it is the medium of academic business, so to speak. This makes sense, as writing demands the careful structuring of concepts, the composition of patterns, the attention to nuance of word use and ultimately, to persuasion. But at the same time, the other language skills should reinforce the processes of writing; and some of the programs reviewed here attempt to do that.

What I sought to do in this selection was to illustrate a range of program types, to make sure that all four language skills were covered, and to include the only profiles on foreign language instruction we received--as well as a very important program on the preparation of future college professors as teachers of language.

The question one ought to ask about all these programs, though, is precisely how colleges emphasize and develop the various language skills, and, in the case of writing, to ask what forms college writing takes and in what contexts college writing in these different forms occurs. The "writing-across-the-curriculum" movement, for example, can

achieve only so much if the dominant form is expository, analytical, and formulaic. It may go much further if the Biology professor knows how to encourage a Lewis Thomas or the Physics professor an Italo Calvino or the Management professor a Peter Drucker. Using forms of writing associated with fiction or drama--dialogue or narrative, for example--will stretch the boundaries of a student's language space, and are appropriate to many disciplines.

Of course, much of the energy expended in college English programs these days focuses on remedial work. There is a serious question about how fast the lack of prior preparation and practice in language skills can be overcome. It has been suggested that if we want language--and writing, in particular--to be taken very seriously in both schools and colleges, we ought to transform all our de facto national examinations (the College Board Achievement Tests, the ACTs, the Graduate Record Exams, etc.) from multiple choice to written formats. By such means, it is held, would writing be restored to the center of the curriculum--very fast, indeed. Maybe so; but as one of our profiles explicitly acknowledges, there are "no quick fixes" here.

Nonetheless, in this section and others, we witness numerous attempts at swift remediation through so-called "Language Skill Laboratories," and that is sometimes troublesome. The more mechanical and behavioristic the instructional methods in those Labs, the less the chance that they will produce good writing. Beneath the surfaces of the language that can be programmed into a computer lie nuance and context and the broader idea of "understanding" that the shared use of language represents. Writing is a social act that is best directed to and shared with others. That does not happen with most technologies designed for individualized instruction. It takes a good writer--not a mechanical writer--to teach good writing, to expand the complex language space of our students.

74. Michigan Technological University

The Writing-Across-the-Curriculum program at MTU is a comprehensive institutional development effort to restore writing to the center of the academic enterprise. But, as is characteristic of similar programs, students are the secondary beneficiaries. The program focuses principally on faculty in all disciplines in order to influence student achievement through improved pedagogical practice.

Begun in 1977, the MTU project integrates a required one-year course in freshman composition with upper-division specialized courses in business writing, technical writing, creative writing and advanced expository writing. In addition, enrollment in humanities courses has been limited in order to permit more frequent assignment and evaluation of student writing. A language skills laboratory, faculty writing workshops and faculty seminars on writing issues in various departments round out the basic program components.

Faculty workshops are the heart of the matter: four-day, off-campus sessions offered twice a year. Leaders and participants are recompensed for their time, and follow an inductive approach to the composing

process through experiential exercises, problem-solving discussions and collaborative writing practice. Nearly half the faculty of the institution have participated--no mean achievement in itself.

During 1982-1983, the Humanities Department conducted an extensive evaluation, of which three components are especially worth noting: (1) a survey of actual writing practices in the classrooms; (2) alternate year senior writing sample assessments (holistically scored); and (3) individual class experiments controlling for particular pedagogical practices. While the results of these evaluations are incomplete, we know that the secondary benefits of the program have been substantial. In fact, one might say that this has proven to be a successful exercise in organizational development analogous to the Computer Literacy project at Wheaton College (see #64). The National Council of Teachers of English has published the project design in book form, and project staff have served as consultants and workshop leaders at other institutions. Within MTU itself, faculty report increased collegial interaction in areas outside the scope of the project.

From 1979-1983, the program was supported by a grant from the General Motors Foundation. Although external funding was important to the development of the program, prior institutional commitment was even more important. That commitment is likely to continue. Indeed, the authors of the profile advise others that faculty engaging in such an effort should be prepared to do so for the long haul.

75. Beaver College (Pennsylvania)

The theoretical base of this Writing-Across-the-Curriculum program, supported by an NEH institutional development grant, assumes that writing is a cooperative, interactive process and a form of social behavior in each discipline. Given that process and behavior, the responsibility of the institution is (1) to model the processes, wherever they may be found, and (2) to foster collaborative learning in all settings.

The program implements these assumptions in a Freshman composition class, through the teaching of writing in all courses, and through a graduate program in the teaching of writing. The result is a comprehensive, connected approach at all levels.

An initial placement test determines whether a student takes 2 or 3 semesters of Freshman composition. The Freshman course itself requires writing practice at a minimum rate of 1000 words per week and four major writing assignments, one of which is coordinated with a student's assignment in another freshman course. In subsequent courses in all disciplines, students learn to do multiple drafts of papers and to critique the work-in-progress of their classmates. In addition, all instructors require in-class writing; and trained undergraduate writing "consultants" are available to assist students in both a Writing Center and during scheduled "dormitory hours."

Assessments of the program have focused on surveys to determine what students do in writing in different courses, how they define and

understand writing, what aspects of writing instruction they find particularly valuable, what kind of comments they receive from faculty about their writing, and where their major problems in writing arise. This effort has been fairly systematic, and the results demonstrate the value of this approach in a field in which the task of measuring improvement strikes many faculty as formidable. (ER)

76. Lake City Community College (Fla.)

The Interrelated Language Skills program at Lake City Community College focuses on the underprepared adult learner, an increasingly important constituent of American community colleges which, as the profile notes, "became the centers of remediation" in higher education in the 1960s.

Sensitive to the abilities, needs and frustrations of its rural constituency in northern Florida, the Lake City faculty examined the early efforts of the community college remediation movement, and concluded that

> "the time, money, and effort devoted to redeeming the underprepared student have been wasted on poorly designed curricular models, short-sighted goals, and inappropriate materials and methods. Traditional remedial courses are mainly attenuated versions of the regular college-level courses. Diagnostic testing and accurate screening often are overlooked as students are placed in programs based on vague objectives and unsubstantiated philosophies. A deficiency in verbal skills has plagued the underprepared student, yet few remedial programs have focused on the development of these skills."

As a result of this analysis, Lake City faculty developed a program that would integrate instruction in reading, writing, speaking and listening, that would begin with oral language skills, and that would give considerable attention to the development of students' self-concept. A 16 week program (involving a minimum of 12 class and tutorial hours per week), covers notetaking, outlining, dictionary use, and research skills in addition to the basic canon of language development. In keeping with its philosophical approach, all classroom activities are designed to incorporate more than one communication skill, e.g. a writing assignment is preceded by listening, viewing, reading and speaking or a proofreading assignment is carried out through the oral presentation of a composition.

It is important to note that this is a total immersion experience analogous to second language learning: during the 16 week period, participating students do little else (though they are encouraged to register simultaneously for music or physical education courses in order to help them integrate themselves with the regular student body). The credit received for the course is "institutional," i.e. non-college level credit.

Recognizing that the effectiveness of a remedial program such as this can only be assessed in subsequent coursework and retention, a control study of 26 students who had completed the program was undertaken.

scored higher in reading and vocabulary (with analysis of variance confirming the effect of the Program), and evidenced a retention rate 20% above the all-College average.

77. Johnson C. Smith University (N.C.)

Dialects are form of the spoken language; and students who both speak and are attuned to non-standard dialects require a holistic approach to language arts involving all four language skills: speaking, listening, and reading--as well as writing.

What is called "The Writing Center" at Johnson C. Smith University involves just such a comprehensive approach to communication skills emphasizing writing. The Center employs modular audio cassettes that help students work through 6-unit "skill packages" covering diction, vocabulary and phonetics (topics that help students who speak non-standard dialects) as well as classic topics in writing. In addition, the Center offers more structured instruction in such practical communication skills as conducting interviews, making introductions, and writing resumes; and offers its services and self-instructional materials to students in any stage of their college education. This comprehensive approach has filtering effects: the remedial student shares the same facility with the more advanced student who has come through the same valley, now stands on a higher plateau and yet is still working to improve his/her communication skills. The example can only be an inspiring one.

While the evaluation data on the nearly 1200 students who have "successfully completed the program" to date were very generalized (self-reports, feedback from instructors, etc.), the presentation is at least convincing by its enthusiasm. It would be more convincing, still, if the Center developed some external reference points with which to measure its success.

78. San Antonio College (Texas)

Between 1967 and 1982, the percentage of students entering San Antonio College with ACT/Verbal scores below 15 (18.2 is the current national mean for all entering freshmen, with 15.7 the mean for entering freshmen at two-year colleges) had increased from 28% to 75%. Faculty simultaneously observed that students were unable to handle the basic reading and writing demands of either academic or occupational courses.

In response, the Multimedia Personalized Systems Laboratory was established in 1979 as an integral part of a Basic English course. It utilizes multiple technologies and an open instructional schedule to accommodate different learning styles, the requirements of teaching time, and the attendance patterns of many part-time and adult students.

The stuff of learning lies principally in the area of writing; and the "software" in the Laboratory is concentrated on five units of study: punctuation, grammar, sentence structure, diction and style, and logic and organization. The technology is arranged around 50 carrels and a classroom for group instruction using a large, multicolor video beam

classroom for group instruction using a large, multicolor video beam display screen in conjunction with other media. Each carrel is equipped with a slide project and cassette player so as to engage the visual and auditory senses in learning (separate special facilities are available for the vision and/or hearing-impaired). A more limited number of typewriters and computer terminals provide an individualized testing system that draws on a data bank so as to allow immediate feedback. If students run into difficulty in the course of working through a study unit, a "dial-a-tutor" learning line is available.

With a plethora of technology and open hours, it is not surprising that "student contacts" with the Lab increased more than 50% in the first three years of operation. During that same period, the percentage of students receiving Ds and Fs in Basic English fell from 54% to 11%--which, in terms of program evaluation, is at least a coincidental indicator. (ER)

79. California State University/Fullerton

How often have we found college textbooks that end each chapter with examples and questions that strike students as more confusing than enlightening? The textbooks may not be well-written; but it is also likely that the students are not reading them well and are not organizing and integrating what they derive from the texts into the overall content of the course at issue. "Left to their own devices," faculty at Calif. State Univ./Fullerton observed, "students rely on inefficient strategies for coping with text assignments." The faculty thus sought an alternative to "the read-memorize-regurgitate-forget cycle."

The answer was the Critical Reading Program, a strategy that adds 10-week, 1-credit minicourses to basic survey courses in history and economics that are heavily reliant on textbooks.

Each minicourse is developed by a faculty team composed of the disciplinary course staff and members of the Reading Department. The team analyzes features of the textbooks such as reading level (usually 10th-11th grade), specialized vocabulary, key concepts, examples, etc., and then develops a reading "guide" to be used in the add-on. This guide includes:

(1) "Graphic Organizers" to help students map out the concepts being presented, and hence perceive relationships among those concepts;
(2) "Selective Reading Guides" that either (a) ask students to define, illustrate and apply key concepts presented in a specific section of the text, or (b) walk the student through a chapter with a governing question posed prior to every 2-3 pages; and
(3) Something called a "concept outline," which sounds intriguing, but which was not illustrated in the materials we examined.

In addition to the "guide," the mini-courses allocate time for integrating text and lectures and for developing techniques of summary and synthesis. As the semester progresses, students are encouraged to develop more open-ended reading guides themselves.

Evaluation of a program such as this must be carried out along two lines of inquiry. First, student assessment of the advantages and disadvantages of the different types of guides; and second, comparisons of performance of those students who elected the mini-course and those who did not. On the first score, CSF faculty found that, as the semester progresses and as students became more comfortable with a course, their preference for the more flexible and open-ended guide forms rose. On the second score, e.g., mini-course students in the basic Economics survey course achieved a slightly higher mastery of subject matter (measured by pre- and posttesting) but with a much lower standard deviation (not surprising in light of their common experience), and considerably higher course grades. Certainly, as the profile notes, the students who devote more time to a subject tend to be more motivated; but that cautionary footnote to the interpretation of grades should not detract from the overall value of this approach to college-level reading.

80. Peirce Junior College (Pa.)

Peirce Jr. College submitted a profile of its Associate in Science Degree program in Court Reporting for reasons other than those we chose to review it. Training a court reporter is not like training a stenographer: it involves achieving proficiency in critical language skills so as to produce clear and logical accounts of proceedings that involve the technical language and concepts of the law and (often) the technical language of medicine. Listening skills are obviously critical (mastery of 4-voice dictation is a must), as are those of the copy editor; and a large and flexible vocabulary must be developed.

The College uses dictation material in English classes, and, in tests of correct usage, asks that students provide not only correct answers but logical explanations for their choices. This requirement involves students far more in the stuff of learning language skills than mechanistic methods or the emphasis on mere recognition and recall endemic to multiple-choice testing. Likewise, to develop the student's proficiency in medical terminology, the student does not merely use a programmed text in an adjunct fashion, but simultaneously takes a regular academic course in Anatomy and Physiology. Courses in Contract and Commercial Law, and an internship round out the program.

Can some of the methods of preparing court reporters be adapted to language skills development courses for other college students? Peirce graduates perform above the national average on their certifying exams, suggesting that there is something going on in their methods that may be worth examination by others.

81. Brooklyn College/CUNY

Nil sine magno labore ("nothing without great labor") is the motto of Brooklyn College; and it is most applicable to the Latin/Greek Institute.

We were tempted to place the Institute under the rubric of Honors Programs; but it is far more instructive as an approach to language

learning. In ten-week summer sessions conducted each year since 1973, the Institute has provided high-powered, intensive instruction in ancient languages to both gifted and motivated students not only from Brooklyn but from other colleges and universities around the country. The target populations include lower classmen who have had no language training prior to college, graduate students who require facility in Latin or Greek in order to pursue their research, postdoctoral students, professionals and others who, for a variety of reasons, desire the enrichment of exposure to ancient texts in their original language.

Participating faculty are rigorously trained in the methods of team teaching in a highly structured, total immersion program (even the secretaries have degrees in Latin or Greek and also serve as tutors). They rotate from section to section, and are available to students 24 hours a day, in person or by phone. Students attend classes for 6 hours per day, with extensive preparation (5-6 additional hours expected daily). An innovative modular schedule geared to the needs of students at different stages of the learning process, and a system of daily advisement and examinations that monitor student progress all allow for attention to individual learning patterns. Despite the demands of the program, such attention no doubt reduces attrition rates (which average 25-30%--in contrast to the 80% rates recorded in most college programs in classical languages). Student achievement, as demonstrated on standardized examinations, subsequent upper division course work, and publication, exceeds that expected even from those who can pass a rigorous admissions process.

82. Francis Marion College (S.C.)

The considerable variation in the preparation of students enrolling in introductory French courses at Francis Marion College led to anxiety among the less prepared, boredom among the better prepared, and frustration among the faculty. At the same time, the foreign language faculty were keenly aware of the fiscal impracticability of offering multiple, ability-grouped sections of their courses.

By 1979-80, faculty attempts to frame a solution led to the realization that self-paced instruction, allowing for heterogeneous grouping in the same classroom, was the most appropriate delivery mode. To match the mode, better instructional materials were required. Faculty examined materials being developed elsewhere for self-paced instruction--and across all four language skills (writing, reading, speaking, translating), and concluded that local needs required locally designed, and more student-centered materials. While the instructional modes chose seem to emphasize the printed word over the spoken, while the examinations the student chooses to take when he/she feels ready are written and not oral, there are a separate set of language laboratories to complement this emphasis. Proficiency, and not time, is the objective of such a mastery learning approach; and students may take up to two semesters to complete a given course.

Four semesters of French are now taught in the self-paced mode at the same hour in the same classroom, with two instructors present to assist individuals and small groups as needed. Evaluation seems to rely

principally on qualitative judgments; but the impact of the program can be measured, in part, by the absence of the need for grammar review in intermediate-level courses.

83. The University of Virginia

The ability of most colleges and universities to deliver the kind of instruction in language that expands students' personal space at the same time that it brings them into a society and economy of communicators is dependent on the quality of faculty training. Most graduate programs in English emphasize literature and scholarship far more than language and pedagogy. And, regardless of discipline, most graduate programs do preciously little to prepare future college teachers as teachers, assuming that the art and knowledge is acquired by osmosis and, in any event, is the responsibility of the institution-of-first-employment.

The University of Virginia offers a very distinguished and highly-ranked graduate program in English that presents the Ph.D. candidate a choice of two tracks: "Language, Literature, and Research" or "Language, Literature, and Pedagogy." While not questioning the merits of the former, it is our intention to draw attention to the latter by comparison of degree requirements.

The research Ph.D. expects students to practice teach one course per semester for a period of from 4-6 semesters. The teaching Ph.D. builds in 16 credit hours (out of 51) of requirements in pedagogical theory and practice, and another 6 in languages studies. The Program also requires both one semester of part-time teaching that is evaluated by members of the Department and one year of full-time teaching in an accredited institution (college or secondary school). The literature/criticism course requirements of the teaching Ph.D. program also recognize that college English teachers are called upon to handle more and more survey and general Humanities courses, and hence demand a far broader coverage of periods and genres than is encouraged in the research Ph.D.

The qualifying oral examinations for the Ph.D. in Language, Literature, and Pedagogy are in three parts, one of which covers the theory of composition or reading, "with pedagogical applications." Instead of a single thesis, the Program requires two "final discourses": one in literary criticism and the other on "educational theory or the teaching of English, or a case study, suitable for submission to a literary or educational journal." And the foreign language requirement for the Program allows students a number of options to demonstrate advanced reading knowledge in one language other than English.

In a 1978 article about the program in College English, Harold Kolb refers to the strategy of the Language, Literature, and Pedagogy program as "watering up the Ph.D." In light of the realities of faculty work and student needs in English, we heartily concur.

PART H:

POSTSECONDARY HONORS PROGRAMS/PROGRAMS DIRECTED AT GIFTED STUDENTS

The Commission received profiles from approximately twenty Honors Programs directed wholly at college students (as distinguished from those college programs operated for gifted high school students), and a smaller number of programs that, while not designated as "honors," are clearly designed to serve the special needs of gifted students at the postsecondary level.

If one were to judge by this sample, there seems to be a finite number of honors program models. These can be described on a matrix of organizational and curricular forms; and there are enough variations within this matrix for one to conclude that the concept of the honors program is well suited to the diversity of postsecondary education in America.

What are the dominant models that came to our attention?

1) The Honors Community. The honors program that stresses the creation of a small and select group of learners within an institution, a group that enters and exits as a community, tends to emphasize organization and support services over curriculum. It is the community that counts, and that community is reinforced as it moves through the institution by both academic and non-academic (e.g. residential colleges, Honors centers) means.

2) "Supply-Side" Honors. The institution that emphasizes the creation of programs from which eligible students select at different stages of their college career is engaging in an honorific form of academic marketing. It is the program--or, more likely, group of programs--that counts first. The theory is that the more (and the more various) honors programs one creates, the more one stimulates student demand and achievement.

3) The "Exponential Major" and Similar Equations. The "honors version" of a college major is the most common variant of this approach. The coherence of program--by discipline or theme--is what counts first; and under this rubric, students are usually selected after their first year of college.

4) General Honors. Customarily, "General Honors" takes the form of an interdisciplinary General Education program, confined to the first two years of college, and with a heavy emphasis on the traditional Liberal Arts. Perhaps this is the way the Liberal Arts ought to be presented to all students, but it seems to be reserved for the few. Some versions of the "General Honors" model simply offer any student with a 3.0 GPA or better the option of different kinds of honors offerings at various times in his/her college career. While there is flexibility for students in this approach, one might argue that the idea of honors loses its integrity if people can drop in and out of the program. Why call it "honors"? Why not say, for example, that a special departmental seminar in X requires a student to have a 3.0 average, and carries an extra credit?

Both within and outside of any of these models of honors programs, such vehicles as independent study and research participation are frequently used to address the needs of gifted students. These vehicles can be used to advance the achievement of other students as well; but the research participation program that involves a "mentorship," for example, seems to be extraordinarily effective for the student who has already moved beyond the rudiments of inquiry.

The most common feature of honors programs is selectivity; but our colleges and universities seem very actuarial about the criteria for selection: cut-off scores on the SATs or ACTs, high school GPAs, etc. are the most frequently used sorting devices. Even those programs that allow a student to enter after the freshman year of college nearly always employ a GPA cut-off. Rarely are qualitative assessments used; and when they are, we find ourselves talking about "exceptions" and "waivers." We thus may be failing to reach and challenge a great deal of talent that is <u>not</u> identifiable by actuarial measures.

However notable their achievements in local contexts, very few honors programs described in these pages seem to have asked themselves what habits of mind characterize the superior, gifted, or unusual student. It is partly for that reason that so many of the honors program profiles we reviewed failed to indicate precisely how it is that their students' learning improves <u>as a result</u> of the "honors experience." They simply have no baseline of learning other than the definition of a "good student" as one with an ACT score of 29 or a GPA of 3.25. That many measure their success in terms of the number or percentage of their honors students who go to graduate or professional school likewise indicates a paucity of self-reflection, since many of those students would probably go on to graduate or professional school irrespective of an undergraduate honors experience. The students testify to the value of this experience, so something may be happening to them. But until we know precisely what it is, we will be unable to help more students achieve the same ends.

84. <u>Washington State University</u>

A "General Honors" model, this program admitted its first students in 1960 after a few years of extensive planning. It has since played a very influential role in terms of other university honor programs established in the 1960s.

The program is a distinct academic entity of the university, with its own budget. Departments are reimbursed (in "teacher assistant coinage") for faculty released time to teach in the program --a common and highly leveraged variant of the released-time purchase formula. Students are invited to participate as entering freshmen on the basis of high school grades and test scores.

The honors curriculum consists of a structured four-year pattern of at least 15 honors courses and seminars (including Junior Year courses in Western and Eastern Civilizations) that amounts to a General Education distribution model with ability grouping. With the exception of English, no two courses are in the same field. Independent study is

required and foreign language study encouraged (roughly ½ of the students in the program take a foreign language). Students in certain majors are also required to complete a thesis.

What makes the classes in this program "honors"? Size, topical focus within the subject, oral presentations, and papers instead of examinations--in other words, opportunities for reflection and depth of study. The Hawthorne effect works rather well when one combines the initial selection process with those characteristics, and 75% of program graduates continue their education beyond college.

This program has been regularly evaluated by students, and periodically evaluated by both internal and external review committees. Its stability and growth stem from long-term administrative commitment, an adequate number of support staff, a distinct physical space, and the enthusiasm of faculty. The program also seems to function as an incubator for new programs, as a haven for innovation, and as a vehicle for faculty development. The University believes the program attracts superior students who would otherwise attend college elsewhere, but there is no hard evidence for that contention.

85. Xavier University/Cincinnati

The Honors A.B. at Xavier University is a selective program that admits 20 entering freshmen each year to an intensive four-year liberal arts course of study. The required core of courses in this program emphasizes classical languages, literature and philosophy--with courses in Greek and Latin sufficient to satisfy the university requirement for a major in Classics. However, most Xavier honors students complete a second major by combining program requirements and electives. The program features weekly tutorial instruction, offers a residential facility for its students, and requires a senior oral examination.

The Xavier program has been in operation since 1948, and has been modified over the years in the direction of fewer required courses than its model, the Jesuit Ratio Studiorum. An accelerated French course is now optional, the number of prescribed courses in philosophy, math and science has been reduced, and students may now substitute economics for history. The program believes that the excellence of the education it provides, particularly in "historical imagination," i.e. the ability to analyze other cultures in other times from their own perspectives and then bring those same perspectives to bear on contemporary western culture. This historical imagination, or "differential perspective," if you will, is born of the demand for integration inherent in any "area study" that takes its language component seriously. But for students to develop a sense of continuity in culture, to be able to identify and adapt to change with the knowledge of what is permanent in change, Classical Studies may fit the bill better than others. There are forms of assessment that could demonstrate the case, and perhaps Xavier faculty will develop them some day.

The achievements of graduates of this program are not unexpected: 25% enter academic careers, and another 20% enter medical professions. Over half of them hold terminal degrees in their respective fields. Whether

the program changed the aspirations of those students, though, is an unanswered question.

86. Tennessee State University/Nashville

The University Honors program at Tennessee State is a variation on the General Honors model that serves approximately 2% of the university enrollment. Founded in 1964, this is one of the oldest honors programs in Tennessee, and has provided assistance in honors program planning to a number of institutions in the southeast.

The program also incorporates elements of the "community of learners" approach through an Honors Office that provides advisement, an Honors Center, and special assistance to students applying for graduate admissions and fellowships. The academic aspects of the program involve two Honors courses per semester, Junior and Senior Colloquia, and a Senior Thesis or Recital. The "courses" appear to be honors sections of regular offerings in the basic sciences, English and World Literature (the latter required of all honors candidates), American history and government, mathematics and public speaking. But it was difficult to tell what distinguishes such ability-grouped courses from others--beyond class size and discussion format.

The Tennessee State program also offers an honors variation for nursing students in a two-year A.A. program. We found no other institutions offering both Associate's and Bachelor's degrees that simultaneously provided students with an honors program at both levels.

The program measures its success both by the academic achievements of its alumni, most of whom continue their education in graduate or professional school, and by alumni responses to a very generalized annual survey.

87. The University of Colorado at Colorado Springs

The profile we received from the University of Colorado at Colorado Springs focused on one departmental honors program, that in psychology. It thus provided the opportunity to examine the type of microenvironment to which other profiles referred.

If there are any hints at all as to how a departmentally-based honors program may be conceived, they lie here. The UC/CC psychology honors program moves some of the structure and processes of a graduate program into the undergraduate curriculum; and that is a logical--though not terribly surprising--conception.

Through a contracted mentorship with a professor, a qualifying Junior psychology major concentrates in a sub-specialty of the discipline, e.g. animal behavior, for two years. In a very measured sequence, the student performs a general literature review, places it in the context of systems and theories in psychology, reflects on the research area within the context of the philosophy of science, develops a research proposal (with particular attention to methodology), pursues and presents the research project, and defends it before a three-person

faculty review committee in the same manner as a dissertation. The Graduate Record Subject Area Test in psychology is required of all honors students in their final semester.

This approach to departmental honors has considerable attractions: it is partly an extension of liberal education in that it places the specialty and the research to be performed in a theoretical context through Honors Seminars on psychological theory and the philosophy of science; it introduces the student to both the collegiality and rigor of graduate work; and it provides a very concrete measure of student achievement against national norms.

So in addition to the evidence of student papers presented at professional society meetings, student papers published, and students going on to graduate school, the program has a very specific reference point with which to judge its success. The secondary benefits of the research mentorship include increased departmental research output and its consequent contribution to institutional advancement.

Do all the students who follow such a program go on to graduate school in psychology? No. The program candidly notes that an unintended outcome for some students is a discontent with "the objectives of professional psychology" as both discussed in honors seminars and revealed to them their their experience. But given the infusion of this program with the spirit of liberal education--critical inquiry--such an outcome should also be welcomed.

88. <u>The William Paterson College of New Jersey</u>

The Biopsychology Honors Program is an <u>interdepartmentally</u>-based undertaking directed at talented state college students who wish to pursue graduate education and who require the challenge and experience of a program at the cutting edge of science to increase their chances of success. The program was carefully negotiated over a two-year period by faculty and student representatives of two departments (Biology and Psychology) that serve overlapping constituencies--not only of their own majors, but also those from Chemistry, Anthropology, and Nursing.

The program can best be described as an add-on to existing majors that requires a group of "core foundations" courses which are also required by the majors. These foundations courses are from the standard offerings: General Psychology, 2 semesters of Biology, 4 semesters of Chemistry (2 for Nursing majors), 2 semesters of Physics, one semester of Computer Science, and either 2 semesters of Experimental Psychology (required of all Psychology majors, anyway) or a statistics course. Once a student has completed half of these courses with a 3.0 average or better, he/she can enter the Honors Program and begin taking a set of four "core biopsychology" courses: Physiological Psychology, Neuroscience, Behavior Genetics, and Topical Electives (e.g. Sociobiology, Psychopharmacology, etc.) All participating departments have agreed to eliminate redundant requirements and to allow certain courses to count toward more than one objective.

The program is ideally suited for pre-medical students, and recruitment begins with an open house reception for talented incoming freshmen and their parents. The more academic features of the honors community are maintained from the freshman year on, particularly colloquia and research participation.

There are two basic measures of program success: graduate school attendance rates (71% for Biopsychology Honors students v. 50% for regular Biology majors v. 33% for regular Psychology majors), and student paper publication and presentations at scientific meetings.

89. University of Alabama

The evolution of the Computer-Based Honors Program at the University of Alabama could become a classic study of institutional change driven by student achievement. The program itself is also one of the few we examined that was able to describe--at least in general terms--the characteristic modes of thought and learning behaviors of honors students. Given that ability, it is thus not surprising that the selection process for this program relies heavily on a two-day series of interviews. The gamut a student must run to be accepted into this program is the equivalent of that at highly selective private institutions. Only 20 are admitted each year, and all receive a modest scholarship.

The program grew out of the creativity and achievement of part-time student employees of the University's computer center in the 1960s. As recounted in the profile, "it became clear that these students were major factors in the rapid dissemination throughout the University of computer familiarity among the faculty and staff," and that these students thus received a unique education: they were master learners.

The form of this honors program involves the student as instructor to the institution. The assumption is that if one trains a select group of students in both computer techniques and their applications to specific subject matter areas, they can subsequently be assigned to assist faculty and staff in acquiring the knowledge and techniques necessary to use the computer as a tool in research, instruction, and institutional management.

What are the characteristics of such students? Empirical research told the program designers that students who have attained a high degree of success in computer applications are those who can reason abstractly and systematically, who can work both independently and in groups, and who evidence a high degree of imagination and creativity. Not all of these capacities can be measured on standardized tests on the order of SATs or (on the other end of the undergraduate pipeline) the GREs or even by such instruments as the Omnibus Personality Inventory. Thus the two days of intake interviews.

The academic program involves not only in-depth training in four computer languages, not only self-instruction in two others, not only the history of computer applications, but also concrete computer application projects in both research and instruction. These projects

are designed in the form of contracts (a fairly standard mechanism of self-paced instruction) and are generally one semester in length. While it is difficult to determine from the profile the requirements of the program in terms of credits, courses, GPAs, etc., the claims made for program success are, prima facie, very credible.

90. University of Georgia

The Honors Program at the University of Georgia was originally established in the College of Arts & Sciences, but later branched out to cover other colleges within the complex organization of a large institution. What is particularly interesting about the Georgia organization is that it is melded with Advanced Placement Programs and National Merit Scholars Programs, thus providing the potential for a full, articulated experience for the gifted student from the secondary through the postsecondary level.

Testing is an important aspect of the selection process for this program. Georgia is one of only three (3) states that currently requires proficiency examinations as part of the credentialling process for college students, and the so-called "Regents' Testing Program," focusing on language skills, has been in place for a decade. Given that tradition, it is not surprising that the University of Georgia offers Advanced Placement tests to incoming freshmen during summer orientation, and that scores on such tests can qualify a student for the Honors Program who may not have qualified on the basis of SATs and high school GPAs.

The 90 courses regularly offered by the Honors Program include accelerated sequences in lower division courses in the disciplines, e.g. a natural science sequence for nonscience majors that integrates physics, chemistry, geology and biology and that seeks mastery of not only basic concepts and methods but also the cultural and social aspects of science. Some of the upper division honors courses are simply seminar versions of major requirements, while others are designed for interdisciplinary integration and appeal to students from different degree programs.

The Georgia program also offers the framework for an "area studies major" in which Honors students design interdisciplinary programs of study within approved guidelines; for challenge credit-by-examination; for participation in graduate courses; and for a combined B.A./M.A. degree.

The program maintains a good deal of data on its students (10% of each entering class) and its alumni, and regularly compares profiles—on specific tests or postgraduate education/employment—of its students with other University graduates. Given the widespread use of tests at Georgia, most of the elements are in place to perform a systematic evaluation of the impact of the Honors Program, and one would trust that that evaluation will be soon in coming.

91. Swarthmore College (Pennsylvania)

What does the notion of an honors program mean in the context of an elite liberal arts college? After all, one could say that the vast majority of the students enrolled are "honors students" to begin with, and that the avowed purpose of the entire institution is to capitalize on the motivated, self-directed learner who tends to gravitate to a demanding undergraduate program.

The Honors Program has been in existence at Swarthmore since 1922. It remains a conscious imitation of the system of "reading" and external examination of British universities. One third of the student body is involved in the program, which concentrates study on a limited number of subjects in the junior and senior years. The student takes only two courses per semester during that time (thus allowing for broader, deeper and more measured learning), and is examined in six subjects at the end of the senior year (with the normal distribution of subjects being four in the major and two in allied fields).

What should be noteworthy to the American reader is the way in which the British external examination system has been adapted. At the end of the junior year, Swarthmore honors students take prelimin- ary examinations--or "trial papers," as they are called--in their six fields. These papers are read by Swarthmore faculty, and serve as a sorting mechanism, i.e. based on the results, some students are advised out of the program. The senior year examinations for those students who remain are written and graded wholly by external readers, who also come to the campus to conduct an oral examination of each student, and in whose sole authority rests the determination of awarding the degree with Honors. This may be an expensive system, but given other opportunity costs, it also may be more efficient than it appears.

By virtue of institutional policy, Swarthmore does not compare the achievement of Honors Program students with those in the regular programs, and thus, by strictly empirical criteria, data on the comparative impact of this program do not exist. But the issue may be moot, as Swarthmore emphasizes that "to be an Honors candidate" in what is essentially an honors institution "is not in itself an honor, but a special kind of opportunity."

92. Tidewater Community College (Virginia)

Data from both the National Longitudinal Survey and "High School and Beyond"--as well as from other studies--clearly demonstrate that a growing number of talented secondary school students are choosing to attend community college. A few community colleges have developed honors programs for these students that can best be described as tracking systems designed to lead to transfer. The Honors Curriculum at the Frederick Campus of Tidewater Community College is noteworthy example of the genre, and takes the form of the General Honors model.

While relatively young (1979), the program offers a manageable and clear approach using existing curricula, an approach that allows any program to establish its organizational niche in an institution fairly swiftly.

As in the case of other programs described here, ability-grouped students take separate sections of English, Biology, Mathematics, Accounting, Business, French, and Engineering in a combination that depends on their degree program, A.A. or A.S. Three courses were created by the Division of Humanities and Social Sciences to complement this approach—World Literature, History of Civilization, and Interdisciplinary Principles of the Humanities—while simultaneously serving to satisfy degree requirements.

Student selection is based on a variety of factors, including an interview "in which members of the honors committee look for intellectual curiosity and general academic potential for excellence." Acknowledging the realities of student attendance patterns, the Honors Curriculum is available to part-time (as well as full-time) students. While the number of students in the program is very small (20 out of an enrollment of 4500), their subsequent success, principally in four-year colleges, has been marked. Given the dedication of faculty, who contributed from their own pockets the only special funds available to the program during its first four years, the Honors Curriculum has an assured future.

93. Loyola University of Chicago

In the course of its nearly 50 years of existence, the Honors Program at Loyola has passed through virtually every conceivable form--including some for which our initial taxonomy fails to account. Originally (1936) an exponential major model operating principally through honors sections of regular courses, the program experimented with a learning contract model in the 1970s. That is, honors students designed their own program of studies, were exempt from parts of the Core Curriculum, and basically followed a path of tutorials and reading courses. By the middle of the decade, a dual program was created, distinguishing between Departmental Honors and University Honors. University Honors seems to receive the primary emphasis. Though we have little information on academic content of University Honors, we have much information on its vehicles: honors credits in regular courses (via contract), honors courses that emphasize the methodology of the disciplines, honors research (a variation on the learning contract), and honors credit for graduate courses. The idea of the honors community is also established early in the program through a Freshman "honors retreat."

The measure of impact used by Loyola is graduate or professional school attendance: 86% of the honors students v. 28% for the college as a whole. Whether that result exceeds the expectations one would normally have for students admitted to such a program, though, is as open a question here as it is elsewhere.

94. Utah State University

The "Space Science Students Program" utilizes the NASA Small Self-Contained Payload program to provide a unique--but comparatively isolated--hands-on learning experience for gifted science and engineering students who are identified and selected while in high school.

The NASA program allows individuals to purchase a container to be sent into space and returned to the user after flight. Such a container was purchased and donated to Utah State, which subsequently challenged high school seniors to propose experimental uses of the container. Those whose proposals are accepted are awarded 4-year tution scholarships plus $500 annual research fund stipends.

While at the University, students must maintain a 3.5 cumulative average and meet all requirements for their majors. The preparation for the flight of the container is the only "honors experience," though it is a highly demanding one. Students are responsible not only for the physics, computer logic, mock-ups, and flight models, but also for NASA safety analyses and paperwork (providing them with a fine introduction to the bureaucracy of research). The first flight occurred on the U.S. Columbia in the summer of 1982.

The program has yet to be formally evaluated; but it is not surprising that all its early graduates have been very successful in their search for jobs in science fields. (ER)

95. Massachusetts Institute of Technology

The Undergraduate Research Opportunities Program (UROP) at MIT is not an honors program per se as much as it is an exemplary mode of challenging highly gifted students. Starting as freshmen, three out of four MIT undergraduates elect to be teamed as junior research colleagues with two thirds of the faculty, and hence can move rather swiftly to the frontiers of knowledge. Far more programs than imagined by its founders have been modelled after UROP--and in far less elite institutions. But the scale and intensity of this program are best suited to research universities of modest size.

The program began as an academic initiative by the Administration, with "a climate of benign collusion in many MIT offices and departments." Each department has a coordinator in the program, and the network of coordinators, cutting across the complex orgnization of the university, is able to break conventional rules and bureaucratic procedures that are critical to the evolution of such an undertaking.

How does one describe UROP accurately? There are features of a co-op program about it, since many participating students receive stipends for research participation during both the academic year (up to 20 hours per week) and summer. Much of the research work is also credit-bearing. But there the resemblance ends. All research participation is established by student proposals (whether the research is the student's own idea or an on-going project of a faculty member). When pay is involved, the proposal is far more than a letter of intent (analogous to a learning contract): it is very much like a grant proposal. No matter what is set out in the original proposal, though, at the end of the project, the student writes an evaluation of both the research experience and the faculty member as supervisor.

How does one judge the success of a program such as this? MIT uses a number of indicators. First, by the thorough institutionalization of

the program among the faculty, for whom it is a spur to professional development, a greenhouse for risky research ventures, and (for junior faculty in particular) an efficient mechanism for building research teams that are often the key to success in science. Second, through the same kind of evidence of research success that would be used to evaluate faculty, i.e. student research papers either published and/or delivered at scientific meetings. And lastly, by faculty, graduate school and employer responses, over time, to the improved quality of undergraduate research; and by student assessment of UROP as "the most significant contribution" to their undergraduate education.

96. Murray State University (Kentucky)

The Presidential Scholars Program is an "honors community" with the unabashed objective of general institutional improvement. The program offers full, four-year scholarships to 12 students each year who demonstrate not only academic achievement (97th percentile or better on the ACTs) but also leadership potential. The 48 students enrolled at any one time in this honors community, it was assumed, could "upgrade the entire student body through their academic and extracurricular performance," as well as change the faculty's perception of the work environment, and thus, indirectly, enable the University to recruit top quality professors.

That is a tall order for 48 students in an institution of 5500. While data maintained since the program was initiated in 1974 indicate that half of them are elected to University-Wide Honors Societies, half of them are officers of academic, religious and social organizations on campus, and half of them go on to graduate and professional schools, there is no evidence that anything has happened to the quality of the rest of the student body, the quality of the institutional environment, or the nature of the faculty's perception of the workplace. I suspect the program governing body would have difficult finding such evidence because, in an open-enrollment institution, 48 students out of 5500 is not a critical mass. A second reason, in this case, is that while Presidential Scholars have the opportunity to design their own curriculum through a major in "Interdisciplinary Studies," Murray State found that many of them behaved no differently than their peers in terms of over-specialization (an attempt to correct this problem has been made by assigning the students to advisors from the program governing committee).

Likewise, the kind of distinctive academic honors program that often has filtering effects on the rest of an institution is here rather minimal. It consists of a one-credit seminar series. Four of these are offered each year (and have included such topics, chosen by students, as Problems in World Agriculture, Sports in Society, and The Recombinant DNA Controversy) and students are assigned to one of them. Yet at the same time, the seminar series serves as a constructive framework for a learning community.

Part I:

ACADEMIC TIME: CALENDARS OF INSTITUTIONS AND INDIVIDUALS

Time in education was one of the major themes of the National Commission's work, and was approached in two ways. First, time was considered as a resource that is allocated, used, and subsequently accounted for by institutions and individuals; second, it was approached as an alterable variable in the teaching and learning process that affects student achievement.

Whether considered from an economic or psychological perspective (i.e. resource or variable), time in postsecondary education is different from time at the school level. There are obvious reasons: postsecondary education is not set in a particular stage of life by external forces such as compulsory school laws. Rather, time in postsecondary education is an element of adult choice. The tradition of the lock-step (the agenda of a full-time, four-year baccalaureate program immediately following high school) has passed. Individuals now enter and re-enter postsecondary education at different stages of their lives. It is thus not surprising that the mean age of college students has risen from 22 to 26 since 1970, that nearly one-third of students in American colleges, community colleges and universities are over 35, and that the proportion of part-time students now stands at 42%--and is rising.

These changes occurred during a period of rapid expansion of higher education in the 1960s and early 1970s, a period during which the accounting system that granted "credits" (proxy measures for time) became more than a certification mechanism. Offering the formulas beloved by bureaucrats and understood by state legislators, this accounting system moved to center stage in the funding of higher education; and our managerial language is now dominated by "Student Credit Hours" and "Full-Time Equivalents." Time was thus transformed into a weapon in institutional politics; and our attention was distracted from more useful ways of thinking about time as a resource and a variable in education. We should have been watching the students who, during this period, started to reallocate personal time for the very purposes of higher education. As costs rose, for example, students worked more and cut back on their academic schedules. And as more and more adults entered higher education, they flooded the "odd" times for course offerings, thus forcing colleges to schedule more courses on weekends, in the evenings, and in large blocks of time on a single day.

Adults require tremendous flexibility in their allocation and use of time for education. Indeed, most of the profiles in this section address different temporal frameworks within which adults seek education. But it would not be heretical to suggest that the traditional age student is also making increased use of these frameworks.

There is a very significant by-product of these changes that may affect our accounting system in ways that go to the heart of what education is about. As it stands, the credit system substitutes time for performance as a measure of learning. Students get "block-knowledge-on-the-install-

ment-plan," move through courses designed for 10 or 13 weeks in classes meeting 3-4 hours per week, and in which the subject matter is shaped by the allocation of time. They pass a test and/or write a paper or two and receive some chits in exchange. When they have enough chits, a bell rings and they get a degree. There is no guarantee in this system that every student has mastered the course material--let alone allied material that may be the stuff of true learning. And some of those chits may be dubiously awarded for subjects that students can pursue in their discretionary time (of which there is far more in higher education than in elementary and secondary school).

But when institutions change the way they allocate time for learning toward more flexible modes, it is almost inevitable that the credit system will be challenged. Thus, in many of the programs reviewed here (as well as those in Part K, "Assessment"), attainment is displacing time as the ground of academic credentials; and with attainment comes Mastery Learning. This is a way of recognizing that individuals learn at different speeds, and that what matters is the bottom line--demonstration of what you have learned, no matter how long it took you to get there. In fact, attainment-based credentials may allow for far more learning in the same amount of time.

Mastery Learning also implies that students are efficient managers of their own time. Certainly we expect that in higher education; but most students in the traditional age cohort are not particularly good managers of time. This executive ability is critical to their persistence; and though it occasionally turns up in the course of the reviews in this section, it receives major emphasis in the course of discussing retention strategies in Part C above.

97. Colorado College

In 1970, and after a period of consideration of the best means to revitalize its academic program and to take advantage of a favorable student/faculty ratio, Colorado College developed and adopted the single-course curriculum known as the Block Plan. The academic calendar is now divided into nine (9) blocks of 3½ weeks each. Under the assumption that more intense periods of student involvement with a subject yield greater learning, students take--and faculty teach--one and only one academic course per time block. Even so, class size averages 14, and is held to a maximum of 25.

The "one-course-at-a-time" curriculum has not appreciably changed the traditional liberal arts education offered at Colorado College. But it has led to some extensions of curriculum and modifications of pedagogy: more field-based courses and special topics classes and fewer general surveys; more computer simulations and fewer labs; greater use of audio-visual materials and journal articles and lesser use of standard textbooks; more quizzes than final examinations; more short essays than term papers. Most of these changes follow logically from the design, though since some courses cover two or three blocks of time, there is still room e.g. for science labs and term papers.

A program such as this requires considerable administrative adjustments: in facilities use, student services, registration procedures, etc. A library, for example, has to replan for the intensive use of specific materials during given time periods. But, even more significantly, a program such as this requires students and faculty to use their daily time in different ways within the same context: lectures, discussions, breaks for lab or library work, etc.

Faculty, student and administrative satisfaction with the program is high; and the number of students applying to transfer to Colorado College has risen along with the retention rate. An elaborate long-term evaluation plan (in place since 1973) centers on surveys of alumni--over 75% of whom consistently rate the plan--and their experiences--very highly. Alumni have particularly noted that they participated more and prepared more for classes--matching the judgments of those faculty who experienced both the traditional semester and block plan arrangements. And the skills in managing discretionary time that were born of the pressure of the block plan, alumni reported, carried over into their adult lives (e.g. they were far less inclined to procrastinate than the rest of us). Continuing review and evaluation processes are underway, and some modifications of the program (e.g. faculty teaching load) have already been made. Unintended consequences include a significant increase in student participation in extra-curricular activities. The College also expects a lower failure rate and a greater sense of community. (ER)

98. Sinclair Community College (Ohio)

Semesters and quarters are often the Procrustean beds of higher education, particularly for adult learners. The divisions of academic time are traditional creatures, but are wholly alien to the rhythms of adult life. The Sinclair "College without Walls" program, derived from the model of the Union of Experimenting Colleges and Universities, is designed to integrate the rhythms of education into those of life.

Perhaps that is a too grand way of putting it. But as soon as one places performance--or competence--at the core of higher education, time ceases to be the driving force. The Sinclair program is like many other performance-based degree programs--flexible and fluid, placing the principal responsibility for defining the process and management of time in education on students. Students must define not only the various competences to be achieved, but also the learning strategies by which their goals will be accomplished and measured. A degree plan embodying a time-and-action calendar is the starting point: when achieved, the Associate of Arts degree is awarded.

The program, which began in 1976, recognizes that not all students would benefit from its challenges. The admissions procedure is rigorous in its own way: only students at the most elite and selective of colleges have to go through the same amount of reflection and analysis of both previous experiences and future learning objectives in their applications. Who says that community colleges cannot develop selective admissions policies? If you have to prove that you are a self-directed

learner on entrance to college, a majority of Ivy League candidates probably could not pass.

As should be obvious, this program proceeds under the rubric of learning contracts. To guide the contract to completion, the student forms a "resource group," including a faculty member, a student peer, and two "community resource" faculty. This group provides both support and quality control as students progress at their own speed to master learning objectives. Of course there is a tremendous burden of honesty on this group--it is a "buddy system" that cannot become too buddy-buddy. Indeed, there was no indication of how the college itself controls for quality in the "resource groups."

Mastery learning (the Benjamin Bloom model that informs efforts such as this) is fine enough; but it tells us more about the process than it does about content. The examples we examined, however--which included such subjects as labor relations, macroeconomics, general Sociology, and marketing--included as much (if not more) "stuff" as would be on the syllabi of very traditional survey courses. That, in itself, is testimony to what this kind of program can produce. And the modes of learning evidenced in those materials indicate that--absent the bed of the traditional academic calendar--students can learn in very diverse contexts.

99. Moorhead State University (Minn.)

The External Studies Program at Moorhead State represents a particularly sensitive and sensible approach to adult learners with a wide range of goals and abilities. It explicitly rejected relying heavily on so-called "alternative delivery systems" (i.e. technology) on the grounds that an absence of personal contact with faculty leaves students alienated. While TV courses and "telelecturing" are utilized by External Studies students, the emphasis in delivery in clearly in another direction.

One of the key requirements of the program that illustrates how a university can combine faculty contact with flexibility in the student's use of time is an "Area Study," a 16-credit project (related to--but distinct from--the major) which leads to a quasi-thesis. The student works with a faculty member on this project in much the same way as a doctoral candidate--at mutually agreed times.

The other components of the degree program are a 64 credit General Studies requirement (including 12 credits of English composition) and a major. Faculty have developed learning packages for courses that students can pace themselves through at home, then meet in groups (with the faculty member) on four Saturdays during a semester. Evidently (though it is not exactly clear from the materials we examined), credit can be awarded in both traditional ways and/or by assessment of competences. The latter is a particularly rigorous process, demanding much time from both students and faculty.

Once a year, the University holds a conference for all its External Studies students, alumni, and faculty. This event, providing community

and continuity, offers participants the chance to evaluate the program, to suggest improvements, and to renew its status in the institution. It is the type of event that all regional universities with external or extension programs should strongly consider.

100. University of Dayton

The "Fast-Track Late Entry Program for Women in Engineering" is a very different kind of variation on the academic calendar from others in this section, and for a very different kind of constituency. Its objectives are to bring women who already hold bachelor's degrees in chemistry, physics, mathematics or computer science to a level of engineering education comparable to that for B.S.E. holders in appropriate sub-fields (e.g. chemical engineering or electrical engineering). It is a non-degree "fifth year" program that qualifies its "graduates" either for employment or for further study at the Master's level.

The program has been offered four times since 1976 to highly motivated adults who wanted to realign their skills to compete in the job market in engineering. The condensed curriculum design, adapted from prototype "late-entry" programs previously developed at Dayton, uses shortened "summer school type" courses, self-paced courses, one-week total immersion courses, and regular 15-week term courses. Starting in January and ending in December, students complete the equivalent of 1½ years of college level engineering work. The program also includes a "professional development" course designed to maximize women's self-concept as engineers through panel discussions, workshops, counseling, and contact with employers.

Formative and final evaluations of the program have been extensive. The data indicate what seems less surprising after the fact: Fast Track students consistently performed at levels higher than traditional undergraduate engineering students, are received better in the marketplace, and consistently express higher job satisfaction.

Formative evaluations resulted in curricular adjustments including: (a) the addition of laboratory courses for more "hands on" experience; (b) the addition of six hours of engineering courses in each track (chemical and electrical) that could be applied toward a second bachelor's degree; (c) integrating Fast Track students with undergraduate students in the regular engineering curricula; and (d) removing a six hour mathematics review sequence for the electrical engineering track students (most of whom had been mathematics majors).

The very rich profile we examined also highlighted unintended consequences of the program that are well-worth pondering by all who would contemplate similar program models. The students have motivated the faculty to make very significant commitments to teaching; facilities have been utilized beyond the point at which the University thought possible; faculty themselves have broken away from traditional instructional assumptions dictated by the traditional academic calendar; and a Women's Reentry Consortium, involving 100 colleges and universities, was born of this effort.

We also referred to "final evaluation," and should explain. The Fast Track Program was one of a series funded by the National Science Foundation to facilitate career changes and/or updating of skills in women previously trained in mathematics and science. NSF eliminated funding for Career Facilitation programs after FY 81; but Dayton has been able to continue at least the electrical engineering track through 1985 under a contract with the Air Force Logistics Command. This new contract includes men and involves more coursework in electronics to match employer specifications.

101. Minneapolis Community College

The College for Working Adults is a new division of Minneapolis Community College, but has already grown to account for 13% of total enrollment. Approximately 400 students take 12 credits per quarter in a Liberal Education program leading to the A.A. degree.

Modelled on the Weekend College of Wayne State University in Detroit, CWA presents a thematic curriculum structured around topics related to adult life experience, e.g. "Work and Society," or "Conflict" (from household to international). The delivery system includes televised courses, weekend conference-seminar courses, and weekly workshop courses held at times and places convenient to students. Under such arrangements, students can complete the A.A. in 2-3 years--compared with longer periods if they confined their course-taking to evening classes.

Academic advising and support services are provided in the community and in workplaces during the evening, on weekends, and by telephone. During its first few years, the College has had to address issues related to articulation between CWA and other organizational processes in areas of budget, faculty workload, and coordination of services. The absence of a state subsidy for public television has resulted in financial strain for the broadcast and leasing of telecourses. However, evaluations by third-parties (as well as faculty and students) are all extremely positive. (ER)

102. Empire State College

You don't have to be a degree-granting statewide coordinating institution to stimulate other institutions to serve adult learners in flexible enough ways so as to allow individual calendars to match the timeless tasks of learning. But you do have to adopt an approach to time in education that involves:

- a continuous academic calendar with opportunities for enrollment at virtually any time during the year;
- a policy for withdrawal and reenrollment which allows students to adjust the balance of work, study, and family responsibilities as individual circumstances require;
- degree programs based on learning contracts which, in effect, organize a student's time;
- a systematic approach to the assessment of prior learning at the point of initial enrollment or reenrollment;
- enough options for methods of study to allow for the efficient

management of a student's time through the learning contract, and
o a flexible, time-based tuition billing system.

Students are admitted to ESC through a central administration, and are subsequently assessed at the College's "regional centers." They then work with "mentors" to plan an independent course of study through learning contracts that may utilize formal courses at area colleges, specially hired tutors in specific subjects, direct study with mentors, consultations with local experts in particular fields, arrangements for conducting research in laboratories and/or libraries, etc. The mentor is thus both an advisor and entrepreneur, who operates with the financial and degree-granting authorities of ESC, but who, working with the deans of the regional centers, also may arrange for local colleges to serve as "hosts" for specific ESC programs.

When learning contracts are drawn up, the mentor or surrogate who is to supervise the particular learning experience determines the amount of credit to be earned (a determination that is reviewed by a regional center administrator). While a number of criteria enter into that determination, ESC has promulgated the broad guideline that 1 credit should represent one week of full-time study. But the interpretation is not so narrow, and the quality control issue is continually addressed through disciplinary area guidelines for credit and through periodic reviews of samples of student work that document different levels of learning within different time periods.

The authors of the ESC profile point out that "the time structure of learning contracts poses several difficulties." If you wish to maintain flexibility "in the pace of study" and at the same time have an accounting system that is based on blocks of time, there are inevitable tensions that arise when students fail to complete a contracted task within the contract dates. To handle such cases, ESC has developed a formula that allows for standards to be set in terms of "rate of progress." The formula is based on a ratio between the number of credits earned and the number of weeks of full-time enrollment. A student is judged to be making "satisfactory progress" if and only if the cumulative rate of progress is 75% of the normal expectation for full-time study. Needless to say, that benchmark is partly driven by standards for state and federal student aid programs.

Working with three other institutions in the SUNY system, ESC has developed four models of collaboration in the delivery of its program, each model respectful of the character of the cooperating institution and the reality of local campus politics and financial support. The capstone model provides an ESC baccalaureate degree at a two-year college in a rural area. The add-on model is a smaller-scale version of the capstone, except in the context of a four-year institution whose faculty were initially skeptical of the quality of a degree achieved largely through independent study. The integrated model involves moving the ESC learning/credit modes into the regular instructional loads of faculty and into the regular programming of a host institution. And the free-standing model is an independent operation of ESC within a community, where the organizations and services in the area (and not the colleges) provide the essential links and supports.

Part J:

JOINT VENTURES OF COLLEGES AND EMPLOYERS/WORKER EDUCATION

Movements for worker education are not new. In fact, they date to the period of rationalization of both industry and the workforce in Europe and the United States in the early decades of the 20th Century. Nonetheless, education and training programs for employees--whether operated by employers themselves, by unions, or by colleges, community colleges and universities--have experienced spectacular growth in numbers and complexity in recent years. The estimates on employer-provided programs range widely, but the most conservative of them claim that between 5-6 million adults are enrolled in regular courses of study in the corporate sector alone, and that corporations spend between $30-50 billion per year on those programs.

Most of the vast non-system of employer and union provided education receives no input from higher education. Where that lack of input is severe--and where state law and practice permits--corporate colleges offering their own degrees have been established; and nearly all such degree-granting colleges founded to date are regionally accredited. In many ways, such developments represent a significant challenge to higher education--they say, in effect, that there is something we are not doing as well as we should be doing. What has resulted is a degree of redundancy in American education in that employers are covering some material in their courses that should have been learned earlier. Redundancy, of course, should be distinguished from necessary repetition in the provision of education. That is, there would be no second or third chance for many adults without the direct provision of educational programs by employers.

That, in fact, is part of the motive behind the continuing education of the workforce. But there are two other modes in which that continuing education is carried out, and in which our principal interests lie. In the first, employers provide "entitlements" for employees to continue their education at institutions of higher education; and these entitlements are part of the benefits package. In the second, employers contract outright with colleges to provide specific programs for specific groups of employees.

The programs taken by individuals under entitlement provisions and those taken by groups under contract can range from traditional liberal arts baccalaureate degrees to baccalaureate or associate's degrees with occupation-specific majors to training courses in very discrete occupational skills to courses of study or services that provide a liberal arts context for a specific occupation or industry. Our selections in this section are designed to illustrate each of these program types--though the most interesting to us were baccalaureate degree programs that sought to develop the employee as a whole person and not merely to serve the narrow needs of the employer.

It is very important to note that the clients for these programs are not merely occasional or part-time students--they are workers. Given the rapid changes in the workplace, some will be changing careers three or

four times; others will be seeking advancement within a career or within an organization. But one of the persistent patterns we noticed--here and in other sections of this document in which programs for adult learners are described--is the tendency for the employee to seek (and the colleges to offer) business curricula to meet this objective of "advancement within a career." For those in dead-end blue and pink collar jobs, this strategy may work. At least it opens the door to lower level white collar positions. For others, however, it is a questionable approach, as the AT&T "Management Progress Study" cited in #105 demonstrates. One might offer the same advice to these students as one would offer to full-time, traditional age undergraduates: if you want to meet the ideal expectations for college graduates as expressed by employers (see the introduction to Part E), there are far better routes than Business Administration curricula.

That issue aside, what do we learn from this very limited sample of programs in terms of making cooperative educational ventures, particularly those of the contract type, work? One has to read between the lines of the profiles we received; but I think that six factors are key:

1) The initiative for establishing the program should come from the employer or union, not the institution of higher education. There is an understandable degree of skepticism among employers when colleges behave in a blatantly entrepreneurial fashion in response to the availability of employee educational entitlements. On the other hand, the proprietary interest of the employer or union is critical to a strong foundation for a program.

2) Once the initiative has been taken, however, the college should insist on both a core curriculum of liberal education--no matter what the employer or union wants to add to that core--and appropriate academic standards. And by a process of assessment similar to that used for regular entering freshmen, the college should determine which employees are equipped to undertake the program and which need special preparatory work.

3) The development phase ought to involve joint seminars devoted to an understanding of the ways in which academic work enhances productivity in the workplace. Both the personnel departments of corporations and public agencies and college faculty and administrators have much to learn about the context in which the other parties operate.

4) Colleges should seek a balance between the "group degree" program model in which a large segment of the curriculum is prescribed and the individualized degree model that provides the adult students with a reinforcing sense of uniqueness.

5) As much as possible, these programs should lead to degrees, not certificates or diplomas.

6) Balanced responsibility for program administration. The role of the college should not be limited to record-keeping, and that of the employer or union not limited to signing checks for educational services.

While there may be other elements in a formula for success, on the basis of reading profiles of the programs reviewed below, these strike me as strong initial guidelines.

103. Memphis State University

Our particular interest in the comprehensive operations of University College at Memphis State lies in three Bachelor of Professional Studies degrees offered in group programs to employees in cooperation with employers and a union; but these can best be understood in light of the overall operations of the College.

University College was established in 1975 to serve the needs of mature students through alternatives to traditional degree programs. Over 90% of its 500 students are 25 or older, and an equal percentage have previously attended college. All students develop a "Baccalaureate Contract" in such a way as to articulate their academic objectives and design their program to assure advising committees that those objectives will be met. Whether programs are individualized or group, the Contracts are required to include:

- o 37 credit hours of lower division interdisciplinary liberal studies courses, e.g. Verbal and Visual Communication, International Studies, Heredity and Ecology;
- o 6-12 credit hours of "Thematic Studies" upper division interdisciplinary courses such as Political Economy, Language and Mind, or Technical and Instrumentation Theory;
- o a 9 credit hour independent study project; and
- o a minimum of 30 upper division credits in an interdisciplinary major that may include internships and credit for experiential learning through a rigorous portfolio assessment process (see #s 110-112 for other examples of portfolio assessment). Students may also use CLEP or credit by departmental examination in both their major and electives.

Some 60% of University College students design individualized degree programs; the other 40% are involved in group curricula. One fourth of this group are taking informally organized programs, principally in human services and health care fields. The remaining 3/4ths are in formal programs requested by and designed for their employers or union. All these programs are delivered on-site through both formal courses and independent study. With their key variations, they are:

(1) An Aviation Administration degree program for employees of the Federal Aviation Administration, and for which the college awards 34 credits for learning represented by the Journeyman's license.

(2) A degree program in Nuclear Industrial Operations to employees in the nuclear power industry in New Hampshire, Arizona, Connecticut and Mississippi. In this program, courses are offered on a total immersion model for time periods ranging from 1-6 weeks; and students are expected to take some General Education courses (unspecified) at a local college. This strategy respects the often very intense work schedules of employees in this industry.

(3) A degree program In Fire Prevention Technology and Fire Administration for members of the International Association of Firefighters in Tennessee and five neighboring states. Out of state students take some General Education courses (again, unspecified) at a local college. The balance of their work--including Liberal Education and Thematic Studies--is pursued via independent study.

In addition, the College has recently developed similar programs in Printing Management (for the In-Plant Printing Management Association) and Alcohol and Drug Abuse Services (for the Tennessee Department of Mental Health). The Liberal Education and Thematic Studies requirements apply in all of these programs. This is a real breakthrough, as these components provide the stuff by which career-oriented curricula can be integrated into larger fields of knowledge and theory, and enable students to develop the capacities for independent reasoning that are increasingly demanded in the workplace.

In all cases, it was the employer, union, and/or association that contacted the College; in some, the College receives small grants (one assumes, for program development and/or administration), while in others, the entitlement is provided directly to the employee. It would be helpful to have more such details on practical matters of interest to college faculty and administrators.

104. Pace University (New York)

The Associate Studies Trimester Evening Program (A-STEP) is designed for full-time white, pink and blue collar workers, and combines liberal arts and business curricula in a trimester model that allows completion of the degree in three years. The flexible 60 credit curriculum is offered two nights per week. The program also provides study skills workshops, counseling, and other support services.

Initiated in 1975 by the Women's Center for Educational and Career Advancement of the National Council of Negro Women, the program then served Black and Hispanic women employed in clerical or technical positions in banks or financial institutions who had not attended college previously. The academic year was divided into four 10-week cycles during each of which students carried a prescribed 6 credit load. The program has since been restructured to serve a broader population, and to provide more flexibility for students. Direct links with employers are not as strong as they initially were, but recruitment is

carried out through direct mailings to employers--including major banks, telephone companies, brokerage houses and insurance companies. Evidently, too, some students (we are not told how many) come to the program with employee educational entitlements or other forms of employer reimbursements.

The curriculum offers students two different schedules to work through a common core of English, Math, Sociology, History, Psychology, Art, Business, Marketing and Management courses, and allows from 4-12 credits of electives. Some courses (e.g. Report Writing and Introduction to Algebra and Statistics) are competency-based; and new students are required to attend Study Skills workshops especially designed for adults.

Admission to the program is not automatic: out of over 1500 applicants, roughly 400 students have enrolled in the program. Many students stop-out for a trimester, but return later to complete the program; and one indication of success is a 73% retention rate. There have been approximately 100 graduates, one third of whom have moved into baccalaureate programs. (ER)

105. University of Pennsylvania

"The effect of specialization has been the corruption of the notion of career," write the administrators of the Penn-CIGNA Program on Liberal Arts and Human Occupations in introducing the idea of offering a liberal education leading to the Associate's or Bachelor's degree to employees of CIGNA Corp. (a larger, multipurpose insurance and financial services company). Through the study of the traditional liberal arts, the program seeks to brings students to the ability to relate career and work to a far broader web of knowledge, including cognitive psychology, organizational sociology, and literature that is particularly illustrative of human choice and development.

What is particularly significant about this Program is that it loudly endorses the contribution of the liberal arts to the development of human capital in business and industry and to the career advancement of those whose primary academic background lies there. The Program cites the 20 year "Management Progress Study" conducted by AT&T which demonstrated that humanities and social science majors "turned in the best overall performance," ranked "highest in administrative skills, interpersonal skills, intellectual ability and advancement motivation," and evidenced "the greatest degree of management potential." Indeed, the AT&T Study showed that humanities and social science majors advanced further and faster in the corporate management hierarchy than either business majors or engineers!!! If that message has yet to reach typical undergraduate students, it certainly has reached the management of corporations such as CIGNA.

Admissions requirements are set by the University's Division of General Studies. Approximately half the applicants are accepted, with another quarter being offered a non-credit preparatory program.

The program provides on-site courses from 4:30-7:00 p.m. daily (earlier than most evening programs, thus enabling students to fulfill family responsibilities); and tuition and fees are paid directly to the University by CIGNA (unlike other employee educational entitlement programs which operate on a reimbursement basis). Initiated in 1981, the program now enrolls over 100 students in any one semester. Classes are taught by regular University faculty; with CIGNA contributing an advisor to oversee operations, scheduling and the counseling of students.

106. Nashville State Technical Institute (Tenn.)

Nearly a quarter of a million individuals are currently employed in the Savings and Loan industry, one that has undergone rapid change in the past few years as the nature of financial services has diversified and as deregulation has intensified. Obviously, a significant portion of the workforce needs the knowledge to be productive and efficient under these changed conditions.

The Institute of Financial Education has joined with Nashville Tech. to provide appropriate programs for S&L employees in the Nashville area. The IFE is the educational affiliate of the U.S. League of Savings Associations, and, since 1922 has provided multi-level professional education and training programs for industry personnel both by correspondence and in group study at local sites. National Office staff research and develop instructional materials and examinations for approximately 50 courses, establish academic standards, train instructors, issue certificates of attainment, and provide administrative support for local chapters. The subject areas covered by the courses include economics, management, data processing, property management and finance, marketing, real estate law, appraising and effective speaking. Strictly speaking, this collection is not industry-specific; but all these courses have direct application to careers in the Savings & Loan field.

The cooperative arrangement between the college and the industry association in this case involves offering of four courses to approximately 100 students (unfortunately, we do not know who they are, what responsibilities they hold in their organizations, or anything about their previous education). Instructors come from a group (including leaders of local business and college professors) approved by the U.S. League of Savings Association, and are trained by the Institute of Financial Education. But beyond providing the space and maintaining student records, it is unclear what role Nashville Tech plays in this program.

107. Fox Valley Technical Institute (Wisc.)

Conducted jointly by the Fox Valley Technical Institute and area Chambers of Commerce, the Small Business Management Clinics seek to harness the resources of the small business community to improve the performance of its members and to create mutual support and accountability among business colleagues. The program enables small business managers who do not have available the training and problem-solving resources of large corporations to meet their needs by means other than conventional classes and seminars.

Employing models of collegial interaction and support that have been used for a long time by medical professionals and that have also been adapted for the clergy, Fox Valley involves small business managers in a "case approach" to continuing education. A diverse and self-selected group of participants meets for several hours twice monthly in sub-groups of 8-14. Each participant has the opportunity to outline a problem he or she confronts, the solutions already attempted and their results. Colleagues, who function like an "outside board of directors," ask questions, offer suggestions, and, under the guidance of a facilitator/moderator, review cases previously examined.

Since January of 1982, two such groups under one Chamber of Commerce have multiplied to five under the joint auspices of three Chambers and Fox Valley. Chambers collect $35 per participant for 12 sessions, part of which is paid in tuition to Fox Valley.

The success of the program is ascribed, in part, to its fundamental philosophy of education: that for adults whose chief social role lies in their work, problem solving is the manifest objective of education and "learning" the latent objective. Thus, grasp of theory and principle follows engaged confrontation with problems. Fox Valley is currently exploring the potential of this model for employees of hospitals, school systems and municipal governments. (ER)

108. Claremont Colleges (Calif.)

The Mathematics Clinic of the Claremont Colleges is an example of a different kind of cooperation between colleges and employers. It is part course, part consulting mechanism, and a quasi-internship. Its subject matter consists of mathematical problems that have arisen in industry or government; and since 1973, some 27 corporations and government agencies have submitted such problems to the Clinic for solution. The students in the Clinic--undergraduate, graduate and post-doctoral--seek to solve the problems; but unlike contract research, they can promise only that they will make the best effort they can. Clients pay a fee that partially offsets the costs of operation. In the process of sponsorship, the clients often find future employees.

The Clinic-as-Course is required for Master's degree candidates in Applied Math and for certain undergraduate concentrations--though it is generally an option for undergraduate majors in their junior and/or senior years. Each Clinic seminar lasts for a year, and involves a team approach to problem solving (a mode of work more common in industry than in the Academy), with the team consisting of a graduate student team leader, students, liaison personnel from the client, post-doctoral or faculty consultants and a faculty supervisor. The faculty supervisor often provides "mini-seminars," i.e. intensive, short investigations of very current mathematic areas--precisely the kind of "crash courses" that are frequent in business, industry and government.

Students gain the experience of developing the modeling and analytic tools necessary to solve real world applied mathematics problems; and also the experience of interacting with a heterogeneous group of colleagues and a feeling for both the marketplace and the workplace.

The measure of success of this program has been in its replication--at some half dozen colleges and universities in the U.S. and Great Britain.

109. Central Virginia Community College

It is a paradox observed by too many that the more internationalized our economy becomes, the more dependent we are on exports, the greater competition we face in world trade, and the more foreign corporations establish operations in the United States, the less our college students study foreign languages and cultures. Partly for that reason, both large corporations and small businesses contract for short language and culture courses for employees in "language-sensitive jobs." The Cross Cultural and Foreign Language Resource Center at Central Virginia Community College performs a number of public service functions and engages in precisely this kind of contract education--principally in foreign languages--to area employers.

The academic functions of the Center within the Community College include the maintenance of instructional programs in German, Spanish and ESL, and the development and offering of courses in Area Studies and in Language and Culture. The ESL programs are provided principally to Indochinese refugees, Middle Eastern students, and employees and families associated with German/American corporations located in the area. The Center has also developed an "area language skill bank," a reference booklet containing abbreviated resumes of qualified interpreters and translators in 14 languages who work in the central Virginia area. The booklet also provides a helpful short guide on translation services.

Of greater interest for our purposes here, the Center has provided a special Spanish language course for secretaries, engineers, technicians and administrators in an international division of General Electric, a Danish language course taught at a local G.E. plant to engineers and administrators, and a French program for engineers, technicians and administrators at Babcock & Wilcox. In all these cases, a specific joint venture in a foreign country provided the occasion. And in all these cases, a focus on three basic language skills (speaking, listening, and reading) was supplemented (as in other similar deliveries) by cultural/historial/political information "packages" on the countries at issue.

The potential of similar efforts by other colleges and community colleges may be great. What is it that employers want from foreign language education? Why is one language skill, writing, not taught? How is proficiency determined? And at what level of proficiency is the employer satisfied? How have employees responded to these programs? And is there any opportunity to create foreign language immersion environments in the workplace? If those--and other questions--could be answered, we would all have stronger guidance than we now possess.

Part K:

ASSESSMENT: THE BOTTOM LINE

The condition of American education is usually measured with reference to the achievement of our students at all levels. And well it should be, since the type, focus and amount of learning are most appropriate to the primary objectives of education. After all, the bottom line of schooling is what students learn.

In its background discussions, the National Commission noted that students receive many conflicting messages concerning what is expected of learning and performance. The less the clarity of expectations, the less likely learning can be improved. More explicitly, the Commission concluded that we have failed to use our most widely recognized measures of learning to upgrade our expectations for student performance. Partly for that reason, A Nation at Risk recommended that

> "Standardized tests of achievement (not to be confused with aptitude tests) should be administered at major transition points from one level of schooling to another . . . . The purpose of these tests would be to: (a) certify the student's credentials; (b) identify the need for remedial intervention; and (c) identify the opportunity for advanced or accelerated work. The tests should be administered as part of a nationwide (but not Federal) system . . . This system should include other diagnostic procedures that assist teachers and students to evaluate student progress."

The Commission thus recognized that while there is virtue in our existing national measures of student achievement to help clarify our expectations, the measures themselves, and, more importantly, our uses of the measures, need to be improved first. Testing without assessment, the Commission would say, is blind.

In a broad sense, all of Starting with Students is about assessment. Our basic question about any program reviewed in these pages has been "What's the bottom line?" What happens as a result of what you do? What happens, in particular, to student learning and growth? Does your program meet its objectives? How do you know?

Assessment is a process that enables programs and institutions to answer those questions, and that becomes an instrument of instruction and learning. But with the exception of using standardized test scores in the admissions process, most American colleges and graduate schools do not think much about assessment. As things stand today, our colleges and universities employ an "input approach" to the measurement of their academic worth: the mean SAT scores of entering freshmen, the percentage of new faculty hires with Ph.D.s, the number of volumes and serials added annually to the library, and, of course, the ratio of microcomputers to students. At best, all these indicators may tell us something of the potential of an institution to influence student learning and achievement. They do not say anything about whether that potential is actualized between matriculation and graduation. And yet, with the costs of higher education rising, students, parents,

legislators and the general public are starting to ask questions about output, not input. And to ask questions about output is to require far more serious and systematic approaches to assessment.

Three movements seem to be afoot to change the traditional disregard of "bottom line questions" by our colleges. The first is the pressure of accountability emanating from state legislatures and focused on public institutions of higher education. We have academic progression tests now in the Florida system and in Georgia; and we have the example of Tennessee's incentive funding system in which colleges are rewarded for improvements in student learning as demonstrated by a variety of instruments and methods. The words have been written on the wall.

The second movement follows the first. When college faculty perceive that their traditional roles in certifying student learning may be pre-empted by a third party, they will rush to protect the academic border. They are beginning to learn about assessment and to develop their own local versions of an assessment program. The evidence of some of the programs reviewed in this section suggests that as faculty engage in this process, they will develop new forms and methods of assessment, flexible enough to cover both the incredible range of fields in higher education and the complexity of student development. We already have experimental measures of creativity and of scientific thinking, for example, and we will see measures of other heretofore elusive mental operations before long. We already have sound models of performance assessment (fine arts, technical subjects), proficiency assessment (second language learning), and portfolio assessment; and some faculty in professional fields are adapting the multifacted "assessment center" approach of many large employers (involving simulations, behavioral observations by expert judges, etc.) who have used this approach for decades.

As some of the programs reviewed in this section also demonstrate, assessment can be a comprehensive information process, not merely a mechanism for sorting and screening students. Most of what we have learned to date about assessment as an information process has emerged from experimental programs serving returning adults, whose prior learning has to be described in enough detail to map a subsequent productive academic program. Too many institutions have sneered at this process, and yet, if it is rigorous enough, not only do students and faculty learn more, but the standards of performance may be higher than those in "traditional" academic programs. As I hope some of these reviews make clear, the reason for that advantage is that the assessment process forces faculty to define their curricular objectives in discrete enough ways--and with discrete enough criteria for the assessment of student learning--that they become more confident of both the objectives and measurements.

The third movement will not be far behind. A generation of college faculty will be retiring in the late 1990s. Despite projected drops in enrollment, we will need to replace most of them. That means a bumper crop of graduate students who will be recruited into the pipeline toward the Ph.D. between now and 1990--precisely the period during which work on assessment will become far more widespread. To the extent to which

our graduate schools expose their future Ph.D.s to at least some of the tools of their trade as college teachers, a decade from now we will have a professoriate far more disposed to measure institutional quality in terms of outputs, and possessing a far greater proprietary interest in assessment than is currently the case.

110. The University of the State of New York

Compared with those of other nations, the American system of higher education is unique in its combining of instruction and certification in the same authority. While some programs in American colleges and universities use external examiners (see #91), and while many colleges grant credit on the basis of examination programs such as Advanced Placement and CLEP, only a handful will award degrees based largely on examination. In 1970, the University of the State of New York, acting through the authority of its Regents, became the nation's first "examination university" through the Regents External Degree Program.

The Regents External Degree (REX) provides adult learners with a flexible format for earning a college degree through proficiency examinations (both written and performance). While the institution itself provides no direct instruction to students, it employs volunteer advisors nationwide to counsel students preparing for examinations. At present, 8 degrees are offered at the Associate and Bachelor's levels. Since 1972, the program has awarded over 18,000 degrees.

Each degree program has different requirements, which are developed and monitored by a committee of faculty from colleges in both New York and other states. These and other faculty also serve as examiners under the Special Assessment program used to evaluate candidates who claim to possess college-level knowledge of a subject for which no other appropriate standardized test exists.

In addition, some 30 College Proficiency Examinations have been developed by the New York State Education Department, and are administered across the country by ACT. The process for developing these examinations is as rigorous as it is for de facto national examinations such as the Graduate Record subject area tests. The major difference is that the Regents exams may mix multiple-choice and essay questions or consist wholly of essay questions. Just how the essay questions are scored was not indicated in the material we reviewed, though it is not difficult to insure that the content specifications of an examining committee are met in essay questions. The same is true for performance-based assessments such as those required of nursing degree candidates who must demonstrate clinical expertise. The special examinations are administered through three Regional Performance Assessment Centers (in Long Beach, Calif., Atlanta, and Denver) in addition to those in New York State.

Examinations are not the only vehicle for completing degree requirements in the REX program. Students may present credits from accredited colleges and non-collegiate courses reviewed and approved for college credit by either the American Council on Education or the New York State Program on Non-collegiate Sponsored Instruction. Students may also

present scores on standardized tests such as the GRE subject area examinations.

Approximately 20,000 students are currently enrolled in the REX program Their mean age is 33, and 83% are employed full-time. A large proportion of enrollees are military personnel (20%) and nurses (35%). Others include employees in high technology industries, educational institutions, health related organizations, banks and law enforcement agencies. Although there are no admissions requirements, a majority of enrollees have previously attended colleges or community colleges.

Given the various options available to REX students, the average time (in months) for completion of the various degrees offered has been as follows:

A.A.	9.7	A.A.S. and A.S./Nursing	23.0
A.S.	12.1	B.S./Nursing	33.8
B.A.	16.4	B.S./Business	31.0
B.S.	17.1		

A 1981 survey sampling degree recipients since 1977 revealed that most have continued their education or plan on doing so. The survey results are fortified by an NIE-sponsored study showing that approximately 60% of the 1977 REX graduates applied for admission to a higher degree program, of which 87% were accepted (73% of these eventually enrolled).

As an assessment program, the REX originally assumed that most candidates would not need much counseling or advisement. This assumption was proven false, and extensive advisement is now available through printed materials, volunteers, and an Alumni Association. The program has also taken steps to develop cooperative relationships with other colleges and consortia in order to provide a wider range of learning and certification options. Similarly, liaison with both business and the military has increased, including formal agreements providing credit for approved training programs and the acceptance of proficiency examinations offered by DANTES, the military testing organization.

111. Trinity College (Vermont)

The Program for Adult Continuing Education (PACE) was initiated in 1971 to encourage adult learners who possessed a high school diploma or GED to enter or re-enter college. From its beginnings, credit for prior experiential learning was an important component of the program. The process by which this credit is awarded has evolved from an informal committee review structure to one in which students examine their knowledge and skills, articulate learning outcomes, analyze these with respect to criteria for awarding credits and complete a synthesis of college-level knowledge.

The result is a "portfolio," written by the student, that both describes and documents specific learning outcomes of prior experience, but that excludes learning for which the student has already earned credit in a formal educational setting. Using materials prepared by the Council for

the Advancement of Experiential Learning (CAEL), students take a course in which they learn how to describe, assess, and place value on discrete competences. For some unexplained reason, the course seems not to be required--and only 37% of the PACE students have taken it.

We are told that the locus of control of the portfolio assessment has shifted from PACE staff to faculty. But what is the assessment process? It appears that once the portfolio is prepared, it is circulated for review by the departments (which occasionally use external consultants) to determine whether college-level learning has occurred. One is encouraged by the identification of "college-level learning" with "a clear theoretical component that includes the inter-relating of the conceptual to the concrete or applied." But unless one knows how that definition is rendered operational, one has no idea of the criteria for credit, or any way to judge the key requirement for "adequate documentation." That fuzziness is counterproductive in experiential assessment programs.

Since 1971, approximately 1,000 students have entered Trinity through the PACE program. Of that number, 200 have graduated (the present enrollment is roughly 300). While it is difficult to judge those numbers as indicative of program success, there is no question that the secondary consequences of PACE have been very beneficial to the institution. The program has highlighted areas of faculty demand and hence assisted in institutional planning. Too, the progressive clarification of assessment criteria over the years has prompted faculty to move toward a competency-based curriculum that is currently being incorporated into the college's general education program.

112. Sinclair Community College (Ohio)

The "Credit for Lifelong Learning Program" is another portfolio process designed for adult learners. The average age of the 1100 students currently in the program (out of a total enrollment of 18,000 at Sinclair) is 39. The program assumes that much learning occurs in non-classroom settings, and that students can be taught to engage in a meaningful analysis and demonstration of that learning. For younger students with little or no work experience subject to such analysis, the program offers a cooperative education component; but it is the older student for whom the portfolio process exists.

The portfolio process is embodied in a course with some interesting "admissions requirements": the ability to write clearly and concisely, preliminary evidence of prior learning, and payment of both special tuition and an "administrative surcharge" for the course. The first of these is an important one if students are to be asked to write up a portfolio; the second guarantees both substance and promises; and the surcharge recognizes that the certification process for experiential learning is probably more expensive than a regular course enrollment.

The course itself requires a number of short papers dealing with personal life history, life transitions, career goals, and the relationship of experiential to academic learning. The portfolio (the culminating product of the course) requires the student to provide 3 or

4 alternatives for "documentation" of each "learning description" or competence claimed. There are thus grounds for assessment. So not only is the entire portfolio evaluated, but faculty also use a variety of criterion-referenced measurements of individual competences: performance assessments, product assessments, paper-and-pencil tests, oral interviews, and simulations. While the profile did not indicate how all of that translates into credits, it provided indirect evidence of quality control: in the period, 1976-1979, nearly 20% of the students were unfavorably assessed, and 13% of the assessments for credit in individual courses were denied.

The program attributes its success to organizational design; and indeed, the Sinclair staff has been rather thoughtful about this matter (organizational structure and processes being an area that most academic administrators and planners do not consider very carefully). The program rejected both free-standing and adjunct service status in favor of an "integrated service capability" within a traditional organization (the college) on the grounds the latter better allowed them to maintain quality control, redefine faculty roles, and provide strong fiscal underpinnings. If quality education for the adult learner is taken seriously, these characteristics are essential.

113. Lander College (S.C.)

In 1973, Lander College underwent a transformation: from a private to a public open-admissions institution. Enrollment doubled, faculty positions increased accordingly, and new programs had to be developed. The college wisely embarked on an effort to know its incoming students well, and to advise them better. A placement testing program became the centerpiece of this effort, and, starting in 1977, was required of all incoming freshmen (the target population has since been expanded to include transfers and readmits as well).

If a placement testing program is effective in advising students into courses, it results in a de facto ability grouping: within any one course, the range of abilities and skills will narrow over time. And if courses do not exist to match critical masses of students of different skill levels, they should be created. According to anecdotal information presented in the profile, both outcomes occurred at Lander.

Incoming students are tested in groups of 100 either during one of four summer orientation sessions or during a pre-registration testing period in early fall. The tests are given on a Monday morning, scored on Monday afternoon, posted in a data base along with other information on each student, and ready for advisors to share with students and use in course planning sessions on Tuesday morning. These tests include the Nelson-Denny Reading Test (vocabulary and comprehension), a writing sample (a single 50-minute essay, read by at least two members of the English faculty), and a departmentally-designed 16 question multiple-choice mathematics test which measures prerequisite skills for a variety of college math courses, from Algebra to Calculus.
On the basis of examination results, students are classified in both gross and discrete ways. The gross categories--"Academic Advisement" and "Academic Alert"--are also based on past academic performance and

SAT scores. These categories are used, in part, to assign appropriate personnel to the advisement process. The discrete categories refer to different levels of proficiency, each of which is matched with a course or a process for remediation, retest, or advanced work. Those students judged to be ready for advanced work are encouraged to take other examinations-for-credit such as the CLEP tests. Advisors use all the information at their disposal to develop realistic expectations in students, and that, in itself, is no mean achievement. Yet a greater achievement has been an increase in the overall persistence rate from 56% to 72% during the first three years in which this program has operated.

114. Alabama State University

As is the case at Lander College, the Freshman Student Assessment Program in the University College of Alabama State evidences a wise use of test batteries for placement purposes. But the context is different: University College is like a "general studies college" within a university, and governs the entire academic life of the student for roughly the first 1½ years of his/her college career. The organization of the institution is such that the other "colleges" accept a student for upper division work only when the student is certified by University College as being fully prepared to pursue a major and a baccalaureate degree.

University College is thus responsible for both the core General Education curriculum and for all remedial and developmental work. As Alabama State is an open-admissions, historically Black institution, its entering freshman class evidences a wide range of abilities. Thus the college practices ability grouping, and uses the test battery to determine placements in one of several broadly-defined "tracks"—from developmental to honors. There is even a developmental track called the "Four Year Plus" curriculum for seriously underprepared students.

At present, the test battery focuses entirely on language and mathematics, with each test matched with an appropriate post-test to assist the institution in monitoring student progress during the freshman year. The program recognizes that "the variables that determine progress are too numerous to permit mono-casual claims" (i.e. we cannot determine that a single course made the difference), but that "a consistent pattern" of change (or no change) in student achievement over the freshman year can be correlated with the track placement.

The program is comparatively new, and needs expansion into other areas of the General Education curriculum (natural and social sciences). Indeed, the College is already moving in that direction.

115. DePaul University

For some mysterious reason, the assessment and advisement of incoming freshmen are unconnected activities in many colleges and universities. Assessment and placement may be handled by a special non-instructional staff or by a small group of faculty who are largely responsible for freshman curricula, particularly in English and Math. Advisement, on

the other hand, is a faculty duty; and most colleges could not cover their students with adequate advisement unless much of the faculty are involved.

The Freshman Assessment and Advisement Program at DePaul was motivated by a dissatisfaction with the comparative lack of feedback inherent in standardized tests, and by too many examples of unproductive course schedules resulting from a barn-hall style freshman orientation and registration procedure. The keys to the program lie in (a) a sensitive battery of locally-developed skills assessment examinations which provide sub-test scores linked to the demands of particular courses, (b) a rigorous and imaginative 5 day faculty development workshop in which the advising skills of faculty--the ability to link information about student strengths, weaknesses and needs to curriculum--are measurably enhanced, and (c) as a result, a highly individualized approach that nonetheless succeeds in covering entering freshman classes of over 1,000 with a core of about 20 trained faculty.

During the 5 day workshop, a day is spent on the theory and practice of skills assessment in reading, writing and mathematics and on the interpretation of the instruments and sub-test scores in relation to the overall academic program at DePaul. Another day involves mock interviews in which faculty pair off and play roles of student and advisor, utilizing information from student files. They are also given samples of student files representing a range of abilities and interests, and are asked to make recommendations for major, allied fields, electives, special courses (honors or developmental), workload, etc. By the fourth day of the workshop, faculty are being tested in actual one hour advisement sessions with entering freshmen.

What kinds of assessments are used in this process; and is the information they generate sufficient to the task? The writing assessment is a 50-minute essay, holistically scored by two faculty from the English Department. The results are not used in isolation, rather in combination with the student's ACT/Verbal and the vocabulary sub-test score from a special administration of the Nelson-Denny Reading Test. These three assessments provide a comprehensive picture of the student's verbal skills, and, depending on their configuration, provide for the basis of placement in a variety of course sequences. The idea is that if faculty know what it takes for a student to negotiate the curriculum successfully, they can recommend different sequences to the same end for students who start with different strengths. DePaul faculty have thus worked out seven (7) initial course placement patterns based on different configurations of scores on these three assessments.

As for mathematics, once again there are three assessments, all locally developed. The two that are used for initial placements are a Computational Skills Tests (40% word problems) and a Basic Algebra Test. In addition, a Pre-Calculus Diagnostic Test devised by the Math Department is employed--for advisory purposes only--for those students who pass the other two assessments.

The information entered in the student files from all these assessments consists of scores--nothing more. If the faculty are confident in what

the scores represent--which is more likely with locally-developed assessments than with standardized tests--the process should work, at least as far as placement goes. Only indirectly--and only with much greater faculty participation, though--will the specifics of the assessment filter back into the classroom and to the student. A score on the Basic Algebra Test does not tell either a student or his/her advisor whether the strengths are in quadratic equations and the weaknesses in radicals, for example. A mediocre writing assessment score does not specifically direct the student toward working on a generic problem such as the organization of essays. There is space on each student's "Skills Assessment Chart" for "additional comments," but there was no indication of how that space was used in ways that might double the impact of the assessment data. This criticism may be a bit unfair, though, since the objectives of the DePaul program are more limited, and, judging by the results of faculty and student surveys, are met in their own right.

116. Ohio State University

The use of assessment as pre-matriculation learning strategy has turned up previously in these pages (see Part A). But the Early Mathematics Placement Program at Ohio State is not tied to a specific pre-matriculation program or the admissions process to a specific institution. Rather, it has become part of a state-wide effort to improve secondary student preparation in mathematics.

Ohio State developed placement tests in mathematics for its entering freshmen in 1961. The current examination is structured so that the student can be assigned one of five "placement levels," each of which indicates degrees of readiness to undertake work in specific mathematics courses. The levels range from 1 (ready for calculus) to 5 (no skills in algebra), with level 3 the basic requirement for math courses required by most major programs at the University. The levels and their criteria are somewhat akin to those used in oral proficiency examinations in foreign languages.

The Program uses these university-developed and administered placement examinations in mathematics for juniors in 614 high schools, the results of which, when combined with transcript analysis, are intended to stimulate increased high school student enrollment in mathematics courses. The intervention--which only occurs on request from the high school--is an examination. But the testing phase has been followed by the introduction of a special senior year mathematics course in 41 high schools, a course providing a highly numerical approach to Algebra and Geometry and designed for those students who tested at remedial levels as juniors.

The test intervention has resulted in notable increases in senior year mathematics enrollments (e.g., at one high school, by 70%) and freshman college mathematics performance (at least among those students who attend Ohio State).

There was no legislative mandate for these changes; but the pressure of public visibility was important in convincing school administrators and local school boards to endorse a very constructive use of assessment.

117. William Mitchell College of Law (Minn.)

While the Law Clinic at William Mitchell is a professional school program, we found its approach to classroom-level assessment particularly instructive. The program has received an award from the American College of Trial Lawyers for "Excellence in the Teaching of Trial Advocacy," and such an award stimulates examination of its grounds.

The Law Clinic takes the student beyond the traditional classroom modes to lawyering skills demonstrations, simulated skills performances and videotaped exercises. But it is also like a cooperative education program in that, in addition to skills courses, each student must represent a real client under the supervision of a faculty member who also tutors, advises, critiques and evaluates. Over 300 students are enrolled in the Clinic; and the supervisor/student ratio is 7:1. What is of interest to us is the four-part evaluation procedure used in the skills courses. For each oral performance and written exercise, the instructor uses:

a) an evaluation form listing 10-12 factors; and assigns a raw score to each;
b) an overall letter grade;
c) written comments to the student that elaborate and extend the critique offered at the time of the performance or exercise; and
d) written comments to a supervising professor explaining factors affecting student performance.

What these evaluation modes require is that instructors have a shared, criterion-referenced set of assessment principles and a commitment to attend carefully to student performance. The four modes preclude arbitrary or whimsical evaluation and have a built-in control feature in the form of senior professorial review.

118. Northeast Missouri State University

A great many college educators have talked in recent years about "value-added," the idea that the best measurement of institutional or programmatic effectiveness is the distance--on publicly accessible measures-- between where students start and where they finish. While the distance is presumably the "value" that is "added" by a program, the more quantitative the measure, the more statistical analysis can refine that distance (regression analyses can tell us what part of that distance is due to the normal course of maturation, college environment, and other factors, and what part of that distance is residual, hence most probably explained by the quality of the program).

Northeast Missouri State is the longest-running laboratory for a value-added assessment program in the nation, and can provide significant guidance to those who would undertake similar efforts.

Initiated in 1974, and with carefully constructed base-line measures to allow for historical comparisons, the program had proven successful enough by 1979 to serve as the basis for an appropriations request grounded in institutional performance rather than enrollment. To those looking for ways to transcend the enrollment-driven funding models that that have nothing whatsoever to do with student learning and institutional productivity, the NMSU experience should offer great encouragement. But one does not expect a system such as this to spring forth in perfect form. There was—and still is—a good deal of trial-and-error.

This is a multi-faceted program, not all of it on a value-added model. How did it develop and how does it work? The first set of tasks was to formulate operational learning goals and an on-line student record data base. The data base contains both test scores and attitudinal surveys. That combination is a constructive one, though we have to look carefully at what tests are used, for what purposes, and how they relate to the professed operational learning goals. Unfortunately, the profile we received told us nothing about the goals, so we were left in the position of imagining the relevance of the examinations.

NMSU started by using the Sequential Test of Educational Progress (STEP) on entering freshmen and on the same group of students as sophomores. The University then shifted to the ACT Residual Examination for the same populations. While the shift was unexplained, one can imagine that it was made to allow comparisons with ACT sub-test scores presented for admissions, and hence to measure the impact of the University's lower-division general education program. Given the limitations of the ACT Residual Exam (it is too generalized for this type of use), the University subsequently adopted the ACT/COMP examination, which is now given to half the freshmen, half the sophomores and a quarter of the seniors. There is thus a mechanism in place to measure the value added by the college experience—at least in the terms of the COMP exam.

The college experience, however, is not monolithic. Student profiles in NMSU's data base include virtually every variable <u>other than</u> courses taken. Thus, beyond the major (a variable that <u>is</u> included), it is difficult to determine the comparative impact of different groups or sequences of courses on change in the COMP score. The data presented in the profile were confined to the previous ACT and STEP testing, but argue indirectly for including the course information. For example, in two of three years in which the ACT Residual Examinations were used, scores in mathematics declined between the freshman and sophomore year. Since mathematics is a wholly school-learned subject, one would expect such a trend only if not many students in the testing sample had taken mathematics in college. But the existing variables do not allow NMSU to make that determination.

One significant portion of the NMSU assessment program does <u>not</u> involve a value-added measure. <u>All</u> seniors are required to take an examination in their major. For most majors, the tests required are either <u>de facto</u> national standardized tests (e.g. the Graduate Record Area Test in Chemistry for chemistry majors) or sub-tests of similar exams (e.g. the NTE English exam for English majors) or occupational licensure

examinations (e.g. in Nursing or Accounting). For others (strangely, Computer Science, Environmental Science, all fine arts disciplines, and Speech Pathology—for which there is a licensure exam) the ACT/COMP is used. And for still other majors, local examinations have been developed. This is a very motley collection, with no indication of how or why the different tests were chosen. Some departments, in fact, use different tests depending on the student's degree. It is difficult to understand why a history major receiving the B.A. takes the GRE Area Test in History while a history major receiving a B.S.E. takes the Social Studies section of the National Teachers' Examination. If one wishes to reflect on the quality of education the history department offers its majors, then one uses the same test for all history majors. If one wishes to predict performance in either graduate school or the first job, then there may be some justification for the different exams. But from the presentation in the profile, the purposes of the tests at NMSU are reflective, not predictive.

What do departments learn from these examinations? The answer depends on the examination and the way in which scores are reported. Subject area tests of the Undergraduate Assessment Program (some of which are used at NMSU) often report sub-test scores. So a Psychology department could glean information over time on the performance of students in social psychology and experimental psychology. If scores in one sub-field persistently lagged the other, the Department could target its improvement efforts. But most of the examinations administered in the senior year at NMSU provide only aggregate information: a department "learns" that a greater or lesser percentage of its students scores above the 50th percentile.

But there is a different—and perhaps more valuable—type of learning that takes place at NMSU, a learning which the examinations stimulate, but do not control. Because the assessment process permeates the institution, departments are in a perpetual state of self-reflection, refining instructional objectives and teaching methods. NMSU was wise to add a set of attitudinal surveys to assist in this process, surveys that follow the student body through the University and into life (the ACT Alumni Survey is distributed triennially). For the students, knowledge that the University cares about their perceptions as much as their performance is extraordinarily important, and perhaps accounts for their acceptance of what might be regarded as a very intrusive program of pulse-taking. For the faculty and administration, student and alumni perceptions are goads to the improvement process, and have resulted in changes such as the raising of admissions criteria, revision of audit and course withdrawal policies, the improvement of the academic advisement system, the hiring of new faculty and the purchase of instructional equipment. There is no question that all this evolves naturally from an institutional culture dominated by a commitment to documenting what happens to students in college.

119. Our Lake of the Lake University (Tex.)

The program for Assessing General Education Skill Competences at Our Lady of the Lake states the rationale for the undertaking in clear and compelling terms:

> ". . .the procedures and standards employed by most institutions of higher learning to certify their graduates are highly suspect and provide little evidence to substantiate either the nature of the learning acquired or the level of competence students have achieved."

The effort itself began in 1971 with a curriculum overhaul driven by competencies (not courses and credits). The assessment program grew, in time, out of the curricular change and its subsequent revisions. The outcomes of this new General Education program were stated in terms of four (4) "areas of knowledge" and ten (10) "lifetime skills." Between 1973 and 1975, most of OLLU's courses were transformed to emphasize as many of those outcomes as appropriate. And during that period, students could demonstrate competence in each of the outcomes through either an external or approved in-course assessment.

Our Lady of the Lake serves a largely non-traditional student population of 1200: 53% Hispanic, 69% female, 65% over 21, and 48% part-time. In light of its experience delivering the new curriculum to this student body, along with its participation in the development of the ACT/COMP examination, the faculty revised the program in 1979 so that student learning in six content areas could be validated in the traditional way (i.e. by course credits), while five "skill competences" and a "synoptic competence" would be validated outside the credit system, and as follows:

Competence	Assessment
1) Sending and receiving information in a variety of settings and for a variety of purposes.	COMP: "Communicating" subscore
2) Analyzing a variety of problems, selecting or creating solutions, etc.	COMP: "Problem Solving" subscore
3) Interacting effectively in a social setting.	Local Assessment: trained raters observe students in a 45 min. discussion
4) Identifying values, understanding how they develop, implications of decisions made on the basis of personal values, etc.	COMP: "Clarifying Values" subscore
5) Expressing oneself creatively in an art form.	Local Assessment: faculty judge student projects, discuss criteria with students
6) Synoptic: "Can integrate liberal knowledge and lifetime skills to produce a reasoned and consistent world view."	COMP: Total Score

While this reviewer has some reservations about using a total score on the COMP examination as a measure of "synoptic competence" as defined by OLLU, the other measurements have face validity.

Students may take the COMP exam after 60 credit hours (a testing fee of $25 covers the costs of administration). When the scores are received

from ACT, students, registrar and advisers are notified. Students who fail any part of the COMP (or one of the local assessments) may turn to a Learning Center for self-instructional modules designed to prepare them for reassessment.

Critical to local uses of an examination such as COMP is the determination of the passing score. OLLU uses cut-off scores which are 1.5 standard deviation below the national mean. The current pass rate is 82% by the beginning of the junior year; and the profile noted that "virtually all students eventually achieve the desired level of competence to graduate on schedule."

The secondary benefits of this program are well articulated at OLLU. Foremost among them is faculty confidence--confidence that the credential awarded carries a "warrantee." But as the assessments can be used for program evaluation (as well as degree-qualifying) purposes, the faculty has gained even greater confidence from ACT studies that demonstrated how much OLLU students exceeded statistical predictions of performance: based on entering ACT scores for a sample of 65 students, OLLU students scored 250% better than predicted on national senior year norms on the COMP. Such a difference is eloquent testimony to the potential of non-traditional students in a program with clearly defined goals, strong quality control measures, and a committed faculty.

120. Alverno College (Wisc.)

Is it fair to describe Alverno as an institutional culture dominated by assessment? Assessment often seems like such a bloodless process that the institution so committed to it would be too distant from its students to have an impact. Alverno has kept the process aspects of assessment in focus, never allowing them to so overwhelm education that learning and instruction are forgotten. Indeed, assessment is the mechanism that keeps the Alverno student in continuous contact with active learning.

Like Northeast Missouri State and Our Lady of the Lake, Alverno is a long-distance runner in the assessment innovation business, committed to student outcomes as the driving force of higher education. But unlike the others, questions of redefining institutional mission and developing a new approach to liberal education were the mold for the assessment program. Over a decade ago, Alverno redefined liberal education in terms of eight (8) general abilities--not in terms of knowledge structures. More significantly for our purposes, the College articulated six (6) levels of performance within each ability. This definition and articulation recognizes sequence and development within any curriculum, and thus is not as much at odds with traditional academic values and departmental orientation as the surfaces may suggest. In fact, it was the avowed purpose of the redefinition "to discern the developmental patterns already embedded" in the disciplines. Such a purpose requires a reflection on curriculum and delivery to a degree of intensity in which the Academy normally does not engage.

If one reflects as the Alverno faculty did, then clear, specific and demonstrable outcomes become the ends toward which the institution

works. Such outcomes know no particular time, space or conditions. Thus, everyone assesses: instructors, trained assessors, volunteer assessors from the community, peers, and, most-importantly, the student herself. The student who develops the ability of self-judgment, after all, has reached an extraordinarily advanced stage of education. Critical to this process is the articulation of specific performance criteria to students long before the actual moment of assessment. And equally as critical is the feedback mechanism.

The professional assessor, or evaluation specialist, is key. All assessors are trained by faculty volunteers in eight "Competence Departments" in such a way that examiners become examinees and in which observation, recording, judgmental and feedback skills are finely honed. The act--not merely the written word--is judged. Words themselves, vehicles of the act, also constitute (in the terms of the philosopher, J. L. Austin) a "performance." To facilitate the observation and judgment of performance, Alverno provides an assessment center with a panoply of technologies and architectures.

A comprehensive assessment system can become so individualized as to preclude monitoring and as to shatter any possibility for common meaning. Alverno claims to have overcome this problem through an Assessment Committee (as well as through the operations of an Office of Research and Evaluation), but the description we reviewed was too generalized to allow judgment of its success in providing coherence to the system. One may argue, however, that to the extent to which assessment is itself a developmental learning process, the system possesses an inherent coherence.

APPENDIX A

Items to be Covered in Profile of Notable Program

1. Title of Program/Name of Institution/Address/Phone/Contact Person

2. Problem(s) addressed by the program. Be as specific as possible. How did you identify the problem(s)?

3. Objectives of the program.

4. Program history and organization. Key dates and steps involved in planning, implementation, evaluation and revision of this specific operation. Is the program based on a model or proposal from a national, regional, statewide or other source outside the institution at which it operates?

5. Specific population(s) for whom the program was developed. What specific criteria (including academic, personal, or other considerations) are used for the inclusion of individuals in the program?

6. Essential characteristics of the program:

   (a) Who does what? where? and when?
   (b) Describe the academic content of the program, the materials and facilities employed, the system of management and organization.
   *(c) What theories or assumptions (if any) lie behind the content and method?
   (d) Special characteristics and training required of instructors and other personnel;
   (e) Special strategies, methods, diagnostic tools, assessment instruments.

7. Program results: the Commission is charged with identifying and examining those programs from which students later achieve "uncommon success."

   *(a) Please cite concrete evidence of the achievement of students while they are in the program. Please note any data on students' success after leaving the program. How long have you been keeping data of this type?
   *(b) How does the achievement cited in (a) exceed the achievement normally expected of the target student population? How do you know? This is an extraordinarily important question.
   (c) What other measures do you use to determine how well the program is meeting its objectives? What have you found?
   (d) Who collects and analyzes data on the effectiveness of the program?

8. Secondary benefits

   (a) What role does this program play in terms of fulfilling the overall objectives of the institution(s) in which it operates?
   (b) What role does this program play in fulfilling the professional aspirations of teachers, administrators, or other participating parties?
   (c) What unintended consequences (positive or negative) accompanied the creation or operation of the program?

9. Which characteristics of the program do you think contribute most to its success (or if the program failed to achieve its objectives, why do you think that happened)?

10. Transportable features

   (a) What kinds and amounts of resources, facilities, etc. does the program require?
   (b) To what kinds of institutions, situations and students is the program applicable?
   (c) What barriers to its success might exist in other settings?

*For programs in which students are the primary beneficiaries, these are the most important questions.

AMERICAN COUNCIL ON EDUCATION
Office of the President

September 17, 1982

Dear Colleague: Re: Notable Academic Programs

The American Council on Education has agreed to assist the National Commission on Excellence in Education in identifying notable programs and promising approaches to key problems in postsecondary education.

The Commission was appointed in August of 1981, by U. S. Secretary of Education Terrel H. Bell to make "practical recommendations" to the nation by March of 1983, about ways and means of pursuing excellence in education. As part of its charter, Secretary Bell asked the Commission "to review and to describe educational programs that are recognized as preparing students who achieve uncommon success. . . ." The Commission has decided to include in its survey notable programs for high-achieving students, average students, and the academically disadvantaged. In addition, the Commission is interested in evidence of the long-term effects of programs on student, faculty, and institutional performance.

I know that this request is an added burden, but Secretary Bell's interest is genuine, and we have agreed to lend our good offices in this endeavor. The problems of interest to the Commission have been identified from a series of public hearings and panels and dozens of commissioned papers. The programs and approaches in which the Commission has interest are listed on the enclosed flyer.

If your institution has developed a program or approach that falls into one or more of the categories listed on the attached, and you would like to have it cited by the Commission, the Commission would be very pleased to receive a program profile. The Commission will make its final recommendations based on long established activity only; the Commission is not in a position to validate programs.

The Commission seeks to understand what elements of those programs might account for the achievement of students who complete them. The Commission intends to use this information to make recommendations encouraging the pursuit of excellence. Profiles received no later than October 29, 1982, will be presented to the Commission in its November meeting. The Commission will select some to cite in its final report. Please limit your response to not more than ten pages; there should be a separate title page with a one-paragraph abstract typed on the bottom half of the page.

If you have any questions during the time you are preparing the profile, please do not hesitate to call Clifford Adelman at the National Institute of Education (202) 254-5555. Should you choose to contribute to this undertaking, I thank you for your interest and effort.

Cordially,

J. W. Peltason

J. W. Peltason

Enclosure

One Dupont Circle, Washington, D.C. 20036-1193
President (202) 833-4710 Vice President (202) 833-4712

APPENDIX B-2

NATIONAL COMMISSION SEEKS EXAMPLES OF NOTABLE PROGRAMS IN HIGHER EDUCATION

The National Commission on Excellence in Education seeks examples of promising approaches and notable programs conducted by the nation's community colleges, colleges and universities in the areas listed below. While the Commission recognizes that the agenda of higher education is vast, it has chosen to focus its attention on those issues and problems that both fall within its Charter and on which it must gather further information before arriving at its final report and recommendations.

I. Academic Content

1. Programs designed to reconcile the goals of career and liberal arts education;
2. Programs--conducted jointly with high schools--designed to eliminate redundancies in secondary school and college curricula;
3. Programs and approaches designed to increase the scientific and technological literacy of students majoring in fields other than science and engineering;
4. Systematic approaches designed to increase students' creative thinking abilities;
5. Competing models of general/liberal education within the same institution;
6. Cooperative efforts with industry to improve college science education.

II. Academic Time

1. Alternatives to the time-based system of credits and credentials, i.e. ways of accounting for learning in higher education other than credits;
2. Programs for assisting students in managing their academic and study time;
3. Variations on traditional instructional time; systematic variations on any of the traditional forms of the academic calendar.

III. Assessment

1. The use of exit examinations other than those in the major;
2. The use of standard college entrance exams for purposes other than admissions;
3. The use of value-added systems of assessment;
4. Systematic approaches to assessing the outcomes of general education.

IV. Pedagogy

1. Components of graduate programs designed to train future college instructors in pedagogy and other related educational subjects;
2. Programs relying heavily on innovations in instructional technology . . . .

V. Teacher Education

1. Approaches to increasing subject-matter content in teacher education programs;
2. Improving teacher education through initial selection and/or exit examinations.

VI. Special Constituencies

1. Undergraduate programs conducted jointly by colleges and employers for the benefit of employees;
2. Programs directed at increasing the rate of transfer and retention of community college students;
3. Programs directed at "gifted" students (the Commission has already gathered sufficient numbers of profiles of programs directed at underprepared students).

VII. Other

1. Institutional procedures to reward faculty for outreach activities vis-a-vis elementary and secondary education, including in-service teacher training in the content of specific disciplines (but excluding pre-service teacher training);
2. Institutional procedures designed to encourage the development and maintenance of such public virtues as honesty and respect among students, faculty, and administrators.